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ABSTRACT

This document includes a final performance report and evaluation report from the Weck Ed program, through which job-linked adult basic education and General Educational Development (GED) test preparation courses that were jointly developed by the company Pilling Weck and Durham Technical Community College were offered to Pilling Weck employees on site at the company's facility in Durham, North Carolina. The final performance report summarizes the following project activities: implementation of task analyses for the company's manufacturing divisions and warehouse; assessment of workers' basic reading, mathematics, and communication skills; provision of 4-8 class periods of mandatory job-related basic skills instruction to 67 workers (including 26 lacking high school diplomas); and development of new policies regarding job classifications and cross-training. Presented in the evaluation report are the following: three units of curriculum materials developed for employees in the company's disposables and instruments divisions and warehouse, work cell member survey, summary of the project's major results, and recommendations regarding program continuation. Appended are the following: reviews of the proposal specifications and midproject report, summaries of interviews with project personnel and participants, evaluation plan, and outline of the oral report to project directors. (MN)

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ED 377 321

WECK ED

WECK EDUCATIONAL DEVELOPMENT PROGRAM

FINAL PERFORMANCE REPORT

NATIONAL WORKPLACE LITERACY GRANT
WECK AND DURHAM TECHNICAL COMMUNITY COLLEGE
DURHAM, NORTH CAROLINA

by

DR. JENNIFER COPLIN
Program Coordinator

December, 1994

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WECK ED
UPDATE, EVALUATION, AND STRATEGIC PLAN

Weck Ed is the name given to the educational program at Pilling Weck's RTP facility. The company began offering Adult Basic Education and GED classes to its workforce on site in 1991. Pilling Weck received a National Workplace Literacy grant in 1993, and a job-linked component was added to the educational offerings. Weck Ed encompasses all activities in which the workforce develops their skills to be equipped for the high performance workplace emerging from their traditional work environment.

This report focuses on the activities of the grant project, how it has met its goals, and how the educational program can continue to promote the accomplishment of company needs. It is written by the program's coordinator, Jennifer Coplin. This report is to accompany the report of the program's outside evaluator, Dr. David Mustian.

Purpose of the National Workplace Literacy Grant Program

The federal project was initiated in order to help America's workforce adjust to new demands due to workplace requirements, technology, products, or processes. This goal is to be met through improvements in the competencies of workers in speaking, listening, reasoning, and problem solving.

Pilling Weck meets all the criteria for funding. The company is undergoing a transition to higher technology, adding products, and moving people into more self-directed and team oriented environments where flexibility is key. A reduction in force has required production workers to be more responsible for work flow, lead times, and quality. Workers are encouraged to learn new skills as well as to make critical decisions.

Over the past year, positive business changes have paralleled the implementation of job-linked education programs. Costs as well as lead times have been reduced. There is a stronger relationship between departments, reflecting a cultural change which is

reinforced by the need to work together as a result of reduced numbers.

It is the opinion of several managers and supervisors that Weck Ed has contributed to the economic upturn of the company through its focus on sharpening thinking skills and problem solving, increasing attention to regulations and procedures, efforts to improve reading comprehension and math operations, and exposure to aspects of the business outside of manufacturing. The Weck Ed coordinator has worked especially closely with the implementation of the work cells in instruments manufacturing.

Goals of the Grant Project and How Well They Were Met

Four goals were laid out for the grant program in the proposal stage. Each of those goals will be examined in terms of strategies used to meet them and progress made.

- **Provide individualized job-related basic skills instruction.**

Each hourly worker in Disposables, the Warehouse, and Instruments Work Cell 2 was pretested for knowledge of basic skills relating to his or her jobs.

On the average, Disposables Operators answered 59% of job related questions correctly when basic skills such as communications, math and reading were required. The test required Operators to read passages from the job specifications and answer questions about them. They were required to read gauges and identify out of tolerance readings. Each Operator received 12 hours of training in a traditional classroom environment on job specific tasks involving reading and math. The average posttest score was 80%. Operators rated the reading comprehension class using job specifications as the most useful. Overall, the reaction to the class was very positive, resulting in

more people signing up for cross-training. The supervisor reported that, as a whole, the group seemed more willing to take on new tasks, to take the tests required for advancement, and they seemed more attentive in meetings following the eight class sessions. Each Operator had at least one individual interview with the coordinator. Some are seeking their GEDs, some are enrolled in basic education courses, and one is in individual tutoring.

In January, 1994, a job linked basic skills test was given to members of Cell 2 in Instruments. The six participants averaged correctly matching 6 of 16 job specifications terms to their definitions. Four of six correctly identified all pictures of tools and machines used in their cell. Almost all team members were able to read and answer questions about charts and graphs. Most were able to find errors in paperwork that they regularly complete. Only half the team members got measurement problems using calipers and micrometers correct even though examples were done for them. Half the group was able to look at a list of measurements next to specification limits and identify which measurements were out of tolerance or rejectable. Four of the six missed at least half the questions asked about a print. The questions were suggested by an engineering technician as being necessary information for them to read. Everyone missed at least one of the seven print questions. The coordinator worked individually for about four hours with one operator in a critical job so that he would at least have the minimum skills to do his job.

More individual or group instruction would be helpful if we want workers to be flexible and independent. We should either organize instruction in measuring, tolerancing, blueprint reading, and machining terms, or select individuals who possess the skills necessary for doing their jobs rather than make assumptions about what workers actually know. Many workers in Instruments want to become as flexible as we want them to be, but they must

be taught more than motor skills in order to fully contribute in a cellular manufacturing environment.

- Prepare workers to use new technology and new methods.

Through the grant project, task analyses were conducted for each manufacturing division and for the warehouse. With the downsizing of all divisions, flexibility was found to be needed in all three areas. Oral communications are important so that workers can teach each other their jobs. Learning to make a logical, sequential oral presentation and seeking understanding through feedback were two common basic skill needs. These needs were addressed through exercises in the classroom, but, optimally, the instructor should have followed workers back to the shop floor and coached the actual process of workers teaching each other their jobs.

Reading gauges and understanding tolerance limits were important in both Disposables and Instruments. Reading and understanding job specifications and prints were also requirements for many jobs. All divisions required employees to get information from tables and record information onto tables. Actual job materials were used in classes in all three divisions. For some employees, low communication, reading, and math skills made job-linked instruction difficult. It is gratifying that approximately 12 of the 30 lacking high school diplomas are enrolled in generic basic skills instruction, which will in turn help prepare them for literacy job tasks. It is a fact, however, that there are probably still about 18 who have not come forward and are still finding ways to compensate for their lack of basic skills needed to perform their jobs.

Thirteen warehouse associates took a pretest designed to measure the skills they used on the job. The major skill areas tested include: Reading comprehension, problem solving, reading

and filling out forms, matching six digit numbers, multiplying and adding whole numbers, reading bar graphs, and reading pie charts.

Reading comprehension includes such skills as identifying factual details from a text to answer a question, skimming, and scanning. The questions were directly based on information in work related text -- the wording of the questions was exactly the same as that found in the text. Four separate questions were asked. Out of 52 possible correct responses, 37, or 71%, were answered correctly.

Problem solving includes the following skills -- comparing theoretical situations with a series of requirements and determining whether the requirements were applicable. The requirements were obtained from an information sheet entitled Your Rights under the Family and Medical Leave Act of 1993. Various theoretical situations were given, and questions asked about the eligibility of the theoretical employees to receive benefits, and why or why not they were eligible. Ten separate questions were asked, and out of 130 possible correct answers, 81, or 62% were answered correctly.

Filling out forms consisted of two types of questions -- reading a commonly used form and pulling out applicable information to answer questions, and filling out a form properly given applicable information. To test the ability to pull information from a form, a move ticket and a pick list (two of the most commonly used forms in the warehouse) were used. To test the ability to fill out a form correctly, a daily forklift inspection form was used. In all, 14 questions were asked. Out of a possible 182 possible correct answers, 165 or 91% were answered correctly.

The section that measured the ability to match six digit numbers (an operation that checkers and pickers perform many times per day) consisted of a column of six digit numbers which had to be matched with the identical numbers in a different order. There

were twelve numbers to be matched. Of the thirteen people who took the test, only seven, or 54%, matched all twelve numbers correctly.

The ability to multiply and add whole numbers was tested by four questions that had the employee multiply the number of boxes by the number of items in a box, and add the number of items in a partially filled box. Of the 52 possible correct answers, 46 or 88% were answered correctly. One employee missed all four questions.

The reading bar graphs section of the test measured three separate skills -- reading a single bar graph in which the bar falls on the line, reading a single bar graph in which the bar falls between lines (interpolating), and reading and comparing multiple bar graphs.
Four questions were asked on reading a single bar graph. Of 52 possible correct answers, 52 or 100% were answered correctly. Two questions were asked about a single bar graphs which required interpolation. Of 26 possible correct answers, 20 or 77% were answered correctly. Four questions were asked on multiply bar graphs. Of 52 possible correct answers, 40 or 77% were answered correctly. Overall, of a possible 130 correct answers, 112 or 86 % were answered correctly.

The reading pie charts section tested such skills as identifying and understanding the heading of a chart, identifying the categories which added up to a certain percentage of the chart, and stating a fact based on the chart. Four questions were asked. Out of 52 possible correct answers, 27, or 52% were answered correctly.

Supervisors report that workers are more responsible for their own quality and cycle times than ever before. They must use judgment since there are fewer "experts" for them to call upon. They must work together, communicating effectively to locate and

solve problems as teams. Paperwork is pushed down to the operator level so that workers need to understand the accounting, inventory and purchasing aspects of the business as well as manufacturing operations. We have addressed these needs through a Leadership Seminar for group leaders. While we expect that they will share information with coworkers, the company might consider a similar program or portions of the program for all workers. Policy deployment, the communication of the business mission and needs, is fundamental to employees making good choices, recognizing priorities, and generally "buying in" to what the company is trying to accomplish. Problem solving, communications, and critical thinking have been identified as basic skills needed in high performance workplaces.

The coordinator has served as facilitator for problem solving meetings held by workers in the new work cells in Instruments Manufacturing. Additional skills are needed by both the team members and the facilitator to improve the effectiveness of the problem solving process.

- Remove barriers to participation in educational programs.

Adults who have not had positive educational experiences in the past do not generally come forward and request remedial help. In fact, in North Carolina, only about six percent of the adult population who need literacy education actually come forward. People learn to compensate for their weaknesses and do not wish to repeat an experience where they were not successful in the past.

It is estimated that there are about 30 hourly employees in the manufacturing workforce who do not hold high school diplomas or the equivalent. Job-linked classes were made mandatory, and 67 employees spent between 4 and 8 class periods learning job-

linked academic skills. It is estimated that 26 of those lacking high school credentials participated in job-linked classes.

One non reading employee is now receiving weekly tutoring through the Wake Literacy Council. He had not attempted to learn to read in his adult life, following a childhood illness that broke up his schooling. He resolved to learn to read following the job-linked classes in which he realized just how much compensating he was doing and how much more there was to know about his job. He has been going to weekly sessions for almost a year and is very happy with his progress.

At least 11 workers have graduated from Pilling Weck's GED program. Supervisors report that their confidence builds when they receive their GEDs, and with that comes greater motivation and self challenge. The supervisors report improved reasoning skills and greater willingness to take on new tasks following completion of the GED program. With Weck's policy of allowing workers to attend classes in part during their regular shift time, the incentive to attend classes is heightened.

In the eyes of the workforce, the status of education has been elevated due to the involvement of management in serving as guest instructors, the encouragement of supervisors, and the positive attention given to those who are striving toward learning. The company newsletter devoted to Weck Ed focused on learning and educational achievements. Many employees were singled out for positive attention who otherwise might go unnoticed. The newsletter placed positive emphasis on learning activities.

Of the 30 workers who lack high school credentials, 12 are pursuing the GED. Two of the 12 are pursuing credentials through classes at the community college, one is in private tutoring, two are in adult basic education classes taught by the coordinator on site, five are in GED classes taught by a Durham Tech instructor on site, and two are studying independently under the coordinator's

supervision. Five of these 12 who are working toward a GED have only one section of the test or a few points to complete in order to receive their diplomas.

In summary, the company has placed an emphasis on viewing the production worker as a whole person, head and hands, and has taken positive steps to develop the mental skills needed for their high performance work environment. The coordinator sees a need, however, to build time into the schedule for workers to cross-train, to teach each other their jobs in order to improve flexibility. At present, time is more or less "stolen" for cross-training. The additional time needed to focus on cross-training would pay for itself. Workers would benefit from time spent learning how to train one another. There is double value in cross-training, since one cannot teach without learning.

Therefore, one barrier to participation in flexibility training is the difficulty of freeing people up for training. This is a challenge still to be met to achieve optimum cross-training and flexibility of the workforce. The creation of two alternate positions for the instruments cells will allow for more time for cross-training. Attention should be paid to scheduling in such a way as to use these alternates to cover for others who are training. Ideally, workers could spend a week at a time learning a new job.

- Encourage workers to continue to participate in training.

The company's generous policy allowing employees to attend on-site GED classes is a strong encouragement to continued participation. The mandatory job-linked classes have also caused some who had negative feelings about education to become willing to try a formal learning experience again.

The new policies concerning job classifications and cross training also encourage employees to become as flexible as possible both in

manual and in mental skills. Time to train is a critical need, especially to promote flexibility in the instruments work cells.

Advocates for training need to come together to create such opportunities as the Leadership Seminars and the job-linked literacy skills classes. Someone in the organization should be named as the official education advocate who can serve as resource, cheerleader, and coordinator of learning activities. Perhaps this official advocate could create an advisory committee to meet and review activities and needs periodically. Learning organizations are truly the wave of the future. According to findings from the U.S. Office of Technology Assessment 1991 report, "Training goes hand-in-hand with productivity, quality, flexibility, and automation in the best performing firms."

Summary of Activities of Week Ed

- Analyzed jobs in Disposables, Instruments, and Warehouse for literacy skills.
- Assessed individual literacy skills.
- Presented a variety of instruction to bring skills to appropriate levels.
- Fostered a culture of cooperation and learning.

Training Needs in the Hourly Workforce Still to be Met

- 18 Workers still lack high school diplomas.
- Some workers in key positions cannot use measuring devices or identify tolerances.
- Some workers in key positions cannot read prints.
- All workers need to engage in learning periodically to keep their minds sharp and stay up to date with changing technology and increasing complexity.
- Continue to foster a culture of learning and understanding each other to promote teamwork.
- Continue to monitor the education center--enrolling participants, conducting back-ups on the CCC computers, ordering materials, and facilitating individual and group learning experiences.
- Develop problem solving skills.

Adherence to target dates: The program adhered to target dates identified in the original proposal.

Number and characteristics of participants: The company underwent a downsizing of about 50% at the outset of the grant period. With half the number of people trying to conduct the workload, we were only able to serve 80 employees rather than the anticipated 180. Of the 30 who lack high school diplomas, we served 26.

Dissemination activities: The program model was shared with two other companies and with two other colleges through activites in conjunction with the Governor's Commission on Workforce Preparedness. The Durham Chamber of Commerce honored the company with an award for placing education as a top priority.

Evaluation activities: The coordinator kept a journal of anectodal information gained from interviews with participants and supervisors which described new literacy skills as tools for productivity on an individual basis. This information was shared with management.

Changes in key personnel. Because of the extensive downsizing of the company, the original project director was terminated in December, 1993. Her boss, however, took a genuine interest in the project and provided the coordinator with necessary resources and support.

WECK ED

WECK EDUCATIONAL DEVELOPMENT PROGRAM

EVALUATION REPORT

Pilling-Weck
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August, 1994

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PREFACE

RESULTS FROM NATIONAL ADULT LITERACY SURVEY

Results from National Adult Literacy Survey

Approximately one-fifth of the adult population in the United States demonstrated skills in the lowest level of prose, document, and quantitative proficiencies. Most individuals at this level were less likely to respond correctly to tasks requiring higher level reading and problem solving skills. Approximately 70 per cent of these adults do not perceive themselves to be at risk. Adults with lower educational attainment levels, who were older, and who were African-Americans were more likely to be at the lowest literacy level.

In North Carolina in 1990, 1,265,680 persons age 25+ (29.8 percent) had educational attainment levels below high school graduation. Corresponding percentages for the white and African-American groups were 26.8 and 47.1 respectively. In Wake County, the percentage of persons age 25+ who were not high school graduates was 14.3. Corresponding percentages for the white and African-American groups were 14.3 and 39.4 respectively. In Durham County, the percentage for all persons without high school graduation was 20.6. Corresponding percentages for the white and African-American groups were 15.5 and 35.3 respectively. In Orange County, the percentage for all persons was 16.4. Corresponding percentages for the white and African-American groups were 16.4 and 47.8 respectively.

Overview

The Weck Ed program grew out of the need to continue a pilot program which had created a partnership between Weck Endoscopy and Durham Technical Community College. The pilot program had begun in 1991 and by 1992, ten Weck employees had completed high school requirements. Thus, the proposed program requested $114,858 to continue the pilot program and to enhance the pilot program. The program was funded in April, 1993, at $62,433.

The major purposes of the program were to: recruit and enroll participants with inadequate basic skills, and provide job related literacy training that increases skills and chances for job advancement. Three foci were basic prerequisites for the program: (1) approximately one hundred of the three hundred employees regular hourly and wage workers at Weck were either functionally illiterate or totally illiterate; (2) rapid technological advances have changed the skill requirements for the workforce, and (3) workplace literacy is very important.

Program Environment

Weck Endoscopy is located in the eastern Piedmont section of North Carolina and one of many private coporations that are part of the composite Research Triangle Park. There are three counties that provide the majority of workers for these businesses: Wake, Durham, and Orange. In 1991, the unemployment rate for these counties was 4.1 % as compared to 5.7 % for the state. The pilot program grew out of an original testing (Test of Adult Basic Education, TABE) which was administered to

32 employees who volunteered to be a part of the project. Over one-half of these workers tested below the sixth grade level and five could not read at all.

Need for the Project

As throughout the total workforce in this country, technological changes at Weck Endoscopy meant that workers not only had to possess basic reading and math skills, but also had to demonstrate interpretive, communicative, team, and problem solving skills. New technology adoption is slowed by the need not only to teach new skills, but to also teach and reinforce basic skills.

The Weck Endoscopy Division employs approximately 500 employees in Research Triangle Park with sixty percent being hourly or wage workers. The plant produces state-of-the-art surgical instruments and other associated products used for hospital operating rooms and other medical uses. At the time of the project, new computerized, production machinery was being integrated into the operation. The goal for the plant was to implement a World Class manufacturing approach based on a team approach to production and production problem-solving, and expectations that workers have the capacity to perform a broader range of functions and an ability to inter-change tasks as required.

Goals and Objectives for the Program

Goal 1

Continue a workplace literacy program that attracts workers who have been hesitant to participate in training by removing barriers that have prohibited their participation previously.

Objective 1: Increase the support of Weck Endoscopy management for the program by briefing all levels of management and supervisors about the program.

Objective 2: Increase program support from all employees by briefing all levels of management and supervisors about the program.

Objective 3: Enroll 25 more employees within 6 months.

Goal 2

Continue a workplace literacy program that prepares workers for making the best use of new technology and new operating methods in order to increase job security and the likelihood of advancement and to maintain viability in the contemporary workplace.

Objective 1: Increase the involvement of plant personnel in developing training programs by including one administrator and two plant workers in curriculum and evaluation design activities.

Objective 2: Identify and analyze no fewer than 20 key job tasks for which the skill levels have increased as a result of technological changes.

Objective 3: Individualize and customize the training curriculum by incorporating examples from each worker's job tasks in his/her training materials.

Goal 3

Establish a workplace literacy program that encourages workers to continue participating in training needed to meet competitive challenges in the world market.

Objective 1: Increase the information available to workers about changes in technology or operating processes.

Objective 2: Sponsor one conference on new technology and competitiveness for all program participants during the project.

Objective 3: Update the Individual Development Plan for 50 percent of the program participants who complete the basic skills instruction to encourage them to continue their training.

Objective 4: Track program participants in other Weck Endoscopy sponsored training programs.

Goal 4

Provide individualized job-related basic skills instruction on a flexible schedule and to provide the supportive services necessary to assure participant success.

Objective 1: Provide no fewer than one half of the workers with job-related basic workplace skills instruction and to achieve at least 65 % successful completion rate as measured by the achievement of individual goals.

Objective 2: Serve, on an open-entry;open/exit basis, 25 workers in the GED component of the program.

UNIT 1

DISPOSABLES MANUFACTURING

NEEDS ASSESSMENT
DISPOSABLES MANUFACTURING

1. Interviews: Managers, supervisors, staff, and assemblers

2. Task Analysis: Specifications, observations, and participation

3. Readability Analysis: Specifications are written on Grade Level 13

4. Individual Pretesting: Average score=59 %

5. Literacy Practices Survey: Assemblers have some difficulty interpreting written information at work. As a group, they do very little reading off the job. Almost fifty percent of the group lack high school diplomas.

GOALS FOR DISPOSABLES CLASSES

1. Enhance basic skills used on the job.
2. Improve workers' flexibility to learn new skills.
3. Encourage teamwork.

TOPICS COVERED IN CLASS

1. Reading a Specification to locate answers to questions.
2. Developing a common vocabulary of work terms in order to teach each others' jobs and paperwork duties.
3. Improving on the giving and following of instructions.
4. Reading a guage and identifying out-of-tolerance readings.
5. Converting percents of sales units in order to determine allowable defects.
6. Understanding the bucket system of inventory and the impact of paperwork.
7. Completing specific forms required of operators.
8. Self-management and teamwork.

JOB TASK ANALYSES

DISPOSABLES MANUFACTURING

LITERACY COMPETENCIES REQUIRED OF ASSEMBLERS
IN WECK DISPOSABLES MANUFACTURING
FOR PRODUCTION AND CROSS-TRAINING

Oral Communications

1. Giving and following sequential instructions.
2. Clarifying questions.
3. Describing one's job duties.
4. Describing safety prodedures.

Reading

1. Reading information from a gauge.
2. Locating information within a text.
3. Comparing numbers for verification.
4. Following sequenced illustrations as guides.

Mathematics

1. Counting whole numbers.
2. Adding and subtracting whole numbers.
3. Estimating 1/8 inch.
4. Estimating 3/16 inch.
5. Estimating 1 inch.
6. Adding and subtracting decimals to tenths.
7. Identifying in and out of specification settings on gauges.
8. Finding allowable defects by multiplying percent of products.
9. Estimating a 90 degree angle.

Critical Thinking

1. Applying information from tables to select actions.
2. Applying text from specifications to select actions.

Writing

1. Recording information in proper sections of forms.
2. Properly correcting mistakes on forms.

Task Analysis Conducted
by Jennifer Coplin

LITERACY TASK ANALYSIS DOCUMENTATION

Job Title: Disposables

Job Task: Loading and Packaging Hemoclip Cartridges

Subtasks	Literacy Skill Applications
Read and follow directions in document No. 14.2.0934.5 and in document No. 14.6.174	Follow sequential directions to complete a task
Place 24 loaded cartridges in poly bag	Count whole numbers
Fill out "Inspection for Hemoclip Cartridges" Document No. 14.6.174.9	Enter appropriate information on to a form

EXAMPLES FROM CURRICULA FOR DISPOSABLES MANUFACTURING

THE IMPORTANCE OF PAPERWORK

VOCABULARY

component

finished product

yields

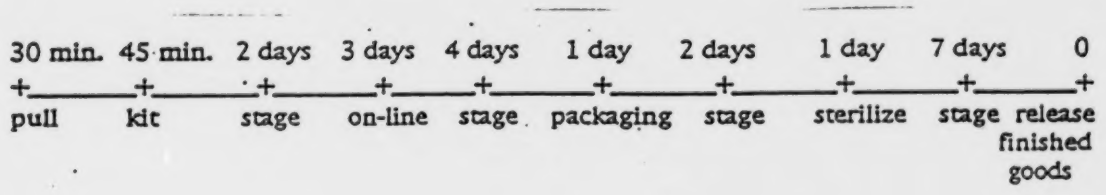
lead time

just in time (JIT)

first in first out (FIFO)

waste

APPROXIMATE TIME FROM COMPONENT PARTS TO FINISHED GOODS



PAPERWORK TRAINING SESSION

Assemblers need to understand how to complete paperwork required of production employees in their departments. Paperwork needs to be completed according to GMP (Good Manufacturing Practices).

- **Read carefully and act accordingly.**

YOUR GOAL:

To teach assemblers how to correctly complete paperwork. Each assembler will correctly complete at least two examples of each form commonly used in the work area. An emphasis will be placed on making corrections according to GMP.

ACTIVITIES YOU WILL LEAD:

Trainers will lead the group through guided practice in 2 examples of each form. Information will then be given in order for participants to complete one form on their own. Trainers will check all completed forms for accuracy.

PREPARATION:

Trainers are responsible for learning anything they need to know to present their lessons. The instructor (Jennifer) will make copies of any forms or handouts trainers need. These copies are to be made before the morning of the class.

Trainers are to use the time during math class for planning and practicing their training session. You may plan to divide the class into smaller groups and rotate them from trainer to trainer or you may wish to keep them together. All trainers are to participate in the session. Trainers are also responsible for learning how to complete all forms.

Practice your communications skills while you plan as well as when you present the lesson.

Anxiety Cues

In addition to involvement versus withdrawal and positive versus negative feelings, nonverbal cues can be used to assess the degree to which persons feel tense or anxious in a group situation. Tension is often related to a combination of *manifest anxiety*, which characterizes a person most of the time, and *situational anxiety*, which builds upon disagreement or conflict in a specific group meeting. Persons with manifest anxiety are reticent, shy, and nervous. However, all persons with normal emotions feel anxiety in some situations, particularly when there is a high level of conflict or the individual feels something must be said that is unpopular or may provoke negative responses. In such cases, the following kinds of cues may be observed:

Tension Cues	Tension Release Cues
Stuttering, stammering	Sighing
Nervous mannerisms of hands or face	Laughing
Incomplete sentences	Giggling
Interruption of self	Yawning or stretching
Voice break or change	Joking, particularly inappropriate
Hesitancy in speaking	jokes or laughter
Very rapid speech	Standing, walking

Again, not all of these cues indicate immediate anxiety. When they occur frequently and in clusters, however, there is a high probability that tension exists or is building.

Status Cues

Finally, there are cues that indicate the relative power of persons or positions in the group. These cues can be used to assess relationships between particular individuals. Status cues include:

Dominance Cues	Submission Cues
Interrupting	Being interrupted
Overriding an interruption	Permitting interruption
Receiving more messages than are sent	Being ignored as a receiver of messages
Being given turns by other persons in the group, being deferred to	Having a turn taken away by others in the group
Talking more often or at greater length than most members	Talking less or more briefly than most members

By watching for these signals, an individual can quickly determine the power relationships in an established group. In a new group, it may take time for power relationships to emerge and become consistent.

Affective Cues

The emotional tone of a group can be observed from the amount and kind of nonverbal facial signals.

Positive Cues	Negative Cues
Smiling	Frowning
Nodding	Shaking head from side-to-side
Eye contact	Lack of eye contact
Laughing	Sighing, crying
Joking	Sarcasm

In some groups, there is a predominant display of positive cues. In other groups, there may be very little evidence of either positive or negative feelings. The latter are relatively "cool" groups in which it is difficult to assess how people feel toward each other. Because of the problems inherent in showing negative feelings, their display is rare in most groups. Nevertheless, negative cues are regularly used by some people in some groups.

Reading Nonverbal Cues in Group Communication

There are consistent, observable nonverbal cues that can be used to assess the status of relationships among group members, as well as the specific relationships among two or more individuals. Four types of nonverbal cues are of particular use to the group observer, member, or leader: involvement cues, affection cues, anxiety cues, and status cues.

Involvement Cues

Involvement is an estimate of the degree to which a person is involved in or withdrawn from the meeting, process, or task outcome of the group. The following behaviors can be signals of involvement or withdrawal when they occur repeatedly:

Involvement	Withdrawal
Alert	Slouched posture
Activity, movement	Passiveness, lack of activity
Eye contact	Avoidance of eye contact
Facing center of group	Turned sideways or outward
Ignoring distractions	Looking out window, attending to non-group matters
Attending meetings	Not attending meetings
Responding to others	Not responding to others
Taking notes	Doodling

A high occurrence of these cues is a fairly reliable indicator of involvement or withdrawal. However, nonverbal behaviors are highly idiosyncratic, differing from one person to another. Some people like to "play the game" of being poker faced or appearing disinterested, perhaps because they wish to catch others off guard. While some persons typically exhibit withdrawal behaviors either intentionally or unintentionally, they may still be highly involved, psychologically.

MEASUREMENT INSTRUMENTS

DISPOSABLES MANUFACTURING

READING SPECIFICATIONS

Name_____ Date_____

Use the Specification for Raney Clip Packaging-Disposables to answer the following questions:

1. Raney clips should be loaded into the feeder bowl up to approximately how far from the bottom of the bowl?

   _____

2. What is the ideal operating range for setting the variable speed dial on the feeder bowl?

   _____

3. Once the clips are loaded into the envelope and the envelope is placed in a chevron pouch, the pouch is heat sealed. The heat seal should be inspected for at least five possible problems. Name three.

   _____

   _____

   _____

Name _____ Date _____

VISISTAT TEST FIRING

Instructions: Use the following words to fill in the blanks below:

secure	if	release	in
trigger	to	away	must
gently	with	frame	put
squeeze	and	closed	closes
the	foam	fall	with

First Test Firing

Check Visistat gun for _____ bond by attempting to _____ separate cover block from _____ (pushing or pulling trigger _____ from frame.)

Hold applier vertically _____ the test firing post _____ front of the nose.

_____ the trigger all the way _____ so that the staple _____ around the post. Care _____ be taken not to _____ pressure against the staple _____ the post. Release the _____ allowing the staple _____ easily disengage from the applier.

_____ the staple does not readily _____ from the applier, fire _____ second staple into a _____ pad. The staple should _____ easily from the applier _____ not tear the foam.

RECEIVING BUCKET

MOO724	J95365	MOO727	J95177	P10845
253845	253256	243315	253319	250540
253845	253256	251762	253319	241703
253845	253256	243821	253319	241703

1. Examine contents of **Receiving Bucket**. You have just received a shipment of components.

2. Place the following components in the **Reject Bucket** since they seem defective: 253845 (1); 251762 (1); and 243315 (1).

3. From the Reject Bucket, 251762 was examined by Quality Control and sent to the **On-Hand Bucket**.

4. Place the following components into the **On-Hand Bucket** from the Receiving Bucket:
243821 (1); 250540 (1); 241703 (1); 253319 (2); 253845 (2); and 253256 (2).

5. Stage Catalog Number 528235 from the Production Order from the On-Hand Bucket. Put components into the **Work-In-Process Bucket.**

6. In production, another component is needed. Complete an Inventory Transfer form for a Supplemental Materials Request for one J95365, lot number 253256 and pick up the component from the On-Hand Bucket and put it into the **Work-In-Process Bucket.**

7. Conduct an inventory of Buckets. Write the components' lot numbers found in each Bucket under each Bucket name.

Receiving **Rejects** **On-Hand** **Work-In-Process**

Operation: Assemble Ring or Wishbone Handle

Spec. Description: Assembly, Ring Handle and Wishbone Handle, S15, M20, and Endo M20 Hemoclip Applier

Spec. No.: 14-2-000099.02

---

1. List the three (3) components used in this operation.

   1.
   2.
   3.

2. The feeder bowl should be filled with approximately _____ pins.

3. Insert a metal link into the cavity closest to the _____

4. After placing the handle and link onto the disappearing pin, the _____ _____ should spring up through the handle body.

5. After the sub-assembly has been ejected from the fixture, make sure that the pin _____ (does or does not) protrude from either side of the handle.

6. If the pin _____, call the set-up person to adjust the machine.

Operation: Tab Fold I

Spec. Description: Sub-Assembly Cartridge, S15 Applier

Spec. No.: 14-2-000079.02

---

1. List the two (2) components used in this procedure:

   1.
   2.

2. Use extreme care when handling the _____ because it is fragile and has sharp edges.

3. Before putting the assembly into the tab fold fixture, you should do what?

   _____
   _____

4. Before pushing the assembly into the tab fold fixture, the number ____ on the cartridge top should be lined up with the mouth of the tab fold fixture.

5. After the folding operation, what should the operator check in the final inspection?

   _____
   _____

6. It is acceptable to hand fold an occasional misfolded tab provided:

   1.
   2.

7. The tab folder may require _____ actuations to insure complete tab folding.

Operation: Tab Fold II

Spec. Description: Sub-Assembly Cartridge, S15 Applier

Spec. No.: 14-2-000079.02

---

1. What component is added to the cartridge assembly at this operation?
   _____

2. The first inspection area once picking up a loaded cartridge assembly is to make sure that the clip feeder _____
   _____.

3. Once the cartridge plug is flush with the cartridge top, use a flat instrument to fold up the _____ on the cartridge bottom.

4. The assembly is inserted into the tab fold fixture until the assembly _____ in the fixture.

5. After the folding operation, the operator inspects the _____ to insure proper folding.

6. It is _____ (acceptable or not acceptable) to repeat the folding steps if required.

7. The tab folder may require _____ actuations to insure complete tab folding.

Operation: Weld

Spec. Description: Final Assembly, S15, Hemoclip Applier

Spec. No.: 14-2-000167.01

---

1. What are the two (2) components that are used in this operation?

   1.
   2.

2. At the beginning of each shift, and/or lot, the operator must obtain a _____ for placement in the lot folder.

3. What three (3) items are recorded on the print out?

   1.
   2.
   3.

4. To obtain a print out, the operator welds a single applier and then holds down the _____ key until an audible tone is heard.

5. At the beginning of each lot, what two (2) things must be reset on the welder display pad?

   1.
   2.

6. What are the set-up readings for the welder:

   1. Horn Pressure: _____
   2. Frequency Output: _____
   3. REF: _____

7. The operator welding test fires _____ clip (s) out of the applier after welding.

8. Squeeze the handles partway until the ratchet clicks into position to verify that the _____ feature is functioning properly and that the _____ action is positioned.

9. The function of the applier is judged by using the S15 _____ _____ list found in section 6.4 of the Final Assembly specification.

Operation: Jaw Tip Setting

Spec. Description: Jaw Tip Setting, S15 Hemoclip Applier

Spec. No.: 14-2-000962.00

---

1. Before tip setting, remove _____ (#) jaws and assemble in a closure base.

2. If _____ of the _____ measures within the limits, no tip setting is required.

3. If tip setting is required, set up the fixture to bring the assembled jaw dimension as close to the _____ as possible.

4. In the fixture set-up, each increment of adjustment will reduce the jaw width measurement _____.

5. Measure at least _____ reworked jaws before reworking the whole bag of jaws.

Operation: Pre-Weld Assembly

Spec. Description: Final Assembly, S15, Hemoclip Applier

Spec. No.: 14-2-000167.01

---

1. What are the four (4) components that are used in this operation?

   1.
   2.
   3.
   4.

2. Seat the shaft assembly into the bottom housing, making sure to properly preload the driver link compression spring against the _____ wall of the housing spring cavity.

3. Liberally coat the flat surface of the ratchet spring with _____.

4. Always assemble the _____ ring handle first.

5. Be careful not to unseat the _____ feet or the driver link spring (the whole bag of jaws).

Operation: Load

Spec. Description: Sub-Assembly Cartridge, S15 Applier

Spec. No.: 14-2-000079.02

---

1. List the four (4) components used in this procedure:

   1.
   2.
   3.
   4.

2. Load no more than _____ ounces of clips into the bowl.

3. Set the variable autotransformer between _____.

4. What metal clip is used in a S15 Hemoclip Applier?
   _____

5. Before inserting the feeder into the cartridge assembly, the feeder should be checked for _____.

6. Before loading clips into a cartridge, the operator must check the
   _____
   on the line track to insure the proper number of clips are staged in the loader.

7. After loading clips into the cartridge, do not jam the pusher into the cartridge because
   _____
   _____.

8. After a cartridge has been loaded, the operator should check:

   1.
   2.

9. Compressions springs that do not move freely over the pusher post may cause

   1.
   2.

Operation: Jaw Housing Sub-Assembly

Spec. Description: Jaw Sub-Assembly, S15 Hemoclip Applier

Spec. No.: 14-2-000961.01

---

1. What three (3) components are used in this operation?

   1.
   2.
   3.

2. The operator must gage the _____ across the jaws for each sub-assembly.

3. The gage probe is inserted into the jaw coining and the gage must read between _____.

4. If the jaw measures outside the range in question #3, the closure base_____ (may or may not) be used again.

5. The gage must be reclaibrated each time it is _____.

6. To calibrate the gage:

   1. Insert the gage master onto the gage tip. It has a _____ I.D.
   2. Push "ON" button.
   3. Hold in "Preset" button until the "P" flashes _____ time. Quickly release.
   4. Press and release the "_____" button again.
   5. Slip the gage master from the gage tip. The number on the gage should be _____ than the preset value.
   6. Turn the gage off at break-time, lunch, and end of shift. The gage must be recalibrated _____
      _____

7. The tab folder may require _____ actuations to insure complete tab folding.

Operation: Test Fire

Spec. Description: Final Assembly, S15, Hemoclip Applier

Spec. No.: 14-2-000167.01

____ When the applier is released slowly, the feeder resists smooth return into the jaw. The feeder should return freely as the handle reopens.
____ Feeder comes out into the jaw without a clip when the applier is actuated.
____ When the ratchet does not hold the handles open prior to the start of clip closure.
____ Feeder picks up/delivers more than a single clip.
____ Clip spits out of the end of the jaw.

3. Because an applier is shipped with a clip _____ into the jaw, be extremely careful not to damage the clip in the jaw.

	LEVEL _____ OPERATION _____						LEVEL _____ OPERATION _____						LEVEL _____ OPERATION _____					
NAME	UT	DATE	T	DATE	P	DATE	UT	DATE	T	DATE	P	DATE	UT	DATE	T	DATE	P	DATE

Operation: Test Fire
Spec. Description: Final Assembly, S15, Hemoclip Applier
Spec. No.: 14-2-000167.01

1. The rejection criteria list for S15 is found in what section of the Final Assembly specification?

2. Match the following defects with the correct description:

a. Poor closure
b. Mis-assembly
c. Component defect
d. Rotated clip
e. Feed failure
f. Double feel clip
g. Slow pusher
h. Spit clip
i. Ratchet failure
j. Scissored clip
k. Slow feeder return
l. Scratchy or tight feel
m. Jumpy return
n. Bond failure
o. Excessive noise
p. Other

___ Malformed clip closure due to misalignment of the jaw coining/tips.
___ Housing cracks open when applier is fired.
___ Pusher action is slow or does not move.
___ Closure gap appears to be too large.
___ Applier feels rough, like metal scrubbing, or feels tight inside of ring handle housing. (A tightness felt at the clip delivery end should go under slow feeder return.)
___ Any defects that are not cosmetic in nature, or that have not been mentioned in other descriptions.
___ Clip that rotates 90 degrees when fed into the jaw. (A rotated clip inside the plastic cartridge is a mis-assembly.)
___ Jaws hesitate before opening, then open quickly at the last second, causing some level of jumpiness. If this is severe enough, the clips may feed into the unopened jaw, causing the entire jaw to jam.

___ Cosmetic or functional defect due to a component that is bent, deformed, etc. (For example, no coining in the jaw, no color on pusher indicator, etc.)

___ Squeaky spring or scraping noises.

___ When the applier is released slowly, the feeder resists smooth return into the jaw. The feeder should return freely as the handle reopens.

___ Feeder comes out into the jaw without a clip when the applier is actuated.

___ When the ratchet does not hold the handles open prior to the start of clip closure.

___ Feeder picks up/delivers more than a single clip.

___ Clip spits out of the end of the jaw.

3. Because an applier is shipped with a clip _____ into the jaw, be extremely careful not to damage the clip in the jaw.

Name_____ Date_____

MULTIVAC AND ELECTROSURGICAL DEPARTMENTS

Use the Inspection for Packaging Material on Multivac form to answer the following questions:

1. What is the Set Point for the Sealing Timer? _____

2. What is the Specification setting for the Hot Embossing temperature? _____

3. Describe the Good Manufacturing Practice (GMP) method for correcting a mistake on a from you are completing.

_____

_____

Showing Your Answers

How important is answering the test questions the way directions state? Read what happened to one student.

> Maria was sure she had gotten an A on her test. It was so easy. But when she got her test back, she was disappointed. She got a B. She had all correct answers. But she circled them instead of underlining them. And she didn't hand in her outline to the essay question as she was supposed to do.

It doesn't seem fair, does it? If you got an answer right, it should be counted right even if you marked it the wrong way. Yet, an important part of taking and passing tests is following directions exactly. That means marking or writing the answers the way the directions say to.

Carefully read test directions. You might read them two or three times to make sure you understand every word. If you don't understand any word or part of the directions, ask your teacher.

PRACTICE

Directions: Below are three sets of test directions and a test question. Explain how each test question was answered in the wrong way.

1. **Directions:** Choose the best word to complete the sentence. Circle your answer.

   Each of the girls (*are*, *is*) on her own.

   Why is the question answered in the wrong way? _____

2. **Directions:** Answer the questions below in complete sentences.

   What are two sources of vitamin A? _____

   Why is the question answered in the wrong way? _____

3. Solve the problem. Show all your work in the space below.

   $15\overline{)42}$

   Why is the question answered in the wrong way? _____

Operation: Assemble Ring or Wishbone Handle

Spec. Description: Assembly, Ring Handle and Wishbone Handle, S15, M20, and Endo M20 Hemoclip Applier

Spec. No.: 14-2-000099.02

---

1. List the three (3) components used in this operation.

   1.
   2.
   3.

2. The feeder bowl should be filled with approximately _____ pins.

3. Insert a metal link into the cavity closest to the _____

4. After placing the handle and link onto the disappearing pin, the _____ should spring up through the handle body.

5. After the sub-assembly has been ejected from the fixture, make sure that the pin _____ (does or does not) protrude from either side of the handle.

6. If the pin _____ call the set-up person to adjust the machine.

Listening and Following Directions

Objectives:

1. To demonstrate to trainees that the directions given to subordinates may be ambiguous and therefore need greater clarity.
2. To demonstrate the need to listen carefully and seek clarification of an unclear message.

Procedure:

Show the following page to the group and direct their attention to each quadrant in sequential order. Move rapidly through this set of directions:

1. Quadrant One: Tell them to place a dot on the letter "i".
2. Quadrant Two: Tell them to print the word "xerox" in the blank spaces.
3. Quadrant Three: Tell them you saw a papa bull (PB), a mama bull (MB), and a baby bull (BB) in a barnyard. Which one should not have been there? (Circle one)
4. Quadrant Four: Tell them to circle the word that doesn't fit with the rest.

The "answers" to these queries are:

1. Quadrant One: Although most will place a dot in the usual place above the "i", they should have placed it on the "i".
2. Quadrant Two: Many will write the letters on the lines; however, the directions told them to write it in the blank spaces, e.g., _X_E_R_O_X.
3. Quadrant Three: There is, of course, no such thing as a mama bull.
4. Quadrant Four: The task is to search for the common denominator among three items and exclude the fourth (many will circle the drum). But as one participant said, "You can beat your dog, your child, or a drum, but you just can't beat sex!"

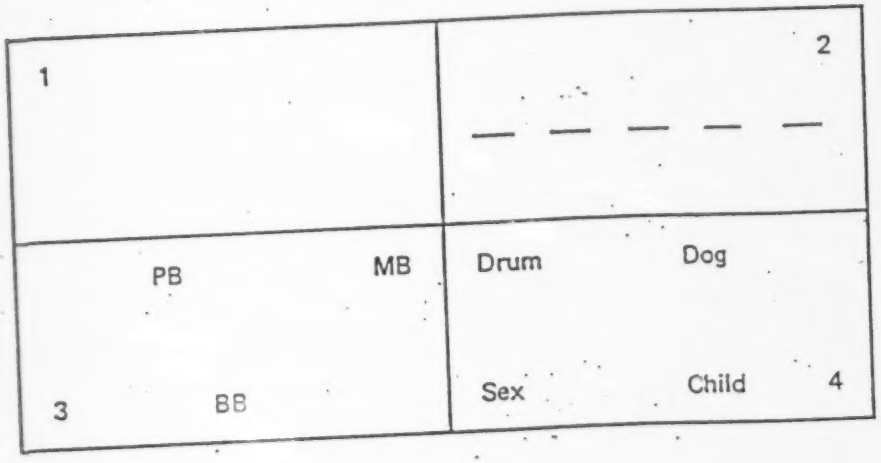
Discussion Questions:

1. Why did we respond incorrectly? (Ambiguous directions, time pressures, failure to listen, failure to seek clarification, our prior habits and conditioning)
2. What lessons does this provide us for being better trainers/trainees/supervisors? (Take action to overcome each of the problems identified in #1)

Materials Required:

Following page on handout card or overhead transparency

WORKSHEET FOR FOLLOWING DIRECTIONS



Listening Test: Riddles

1. Is there any federal law against a man's marrying his widow's sister?

2. If you went to bed at eight o'clock at night and set the alarm to wake up at nine o'clock in the morning, how many hours of sleep would you get?

3. Do they have a 4th of July in England?

4. If you had only one match and entered a cold room that had a kerosene lamp, an oil heater, and a wood stove, which would you light first for maximum heat?

5. How many animals of each species did Moses take aboard the Ark with him during the great flood?

6. The Yankees and the Tigers play 5 baseball games. They each win 3 games. No ties or disputed games are involved. How come?

7. How many birthdays does the average man have? The average woman?

8. According to International Law, if an airplane should cras on the exact border between two countries, would unidentified survivors be buried in the country they were traveling to, or the country they were traveling from?

9. An archeologist claims he has dug up a coin that is clearly dated 46 B.C. Why is he a liar?

10. A man builds an ordinary house with four sides, except tha each side has a southern exposure. A bear comes to the door and rings the doorbell. What color is the bear?

EXAMPLES OF MATH TESTS

DISPOSABLES MANUFACTURING

MATH CLASS
TEST
DISPOSABLES UNIT

1. Circle the numbers which are 75 +/- 5.

   72
   82
   80
   83
   71

2. Circle the numbers which are 7.5 +/- .5.

   6.0
   7.1
   8.0
   8.1
   7.9

3. Circle the numbers which are 85 +/- 2.

   84
   80
   87
   81
   88

4. What is 2 % of 350?

5. What is 3 % of 300?

6. What is 2 % of 200?

MATH CLASS
DISPOSABLES
POST TEST

1. Circle the numbers which are 180 +/- 10.

   172
   192
   165
   188
   190

2. Circle the numbers which are 7.5 +/- .5.

   7.0
   6.9
   7.2
   7.9
   8.2

3. Circle the numbers which are 60 +/- 2.

   54
   58
   65
   61
   69

4. What is 1 % of 100?

5. What is 2 % of 200?

6. What is 1 % of 200?

EVALUATION

UNIT 1

DISPOSABLES MANUFACTURING

EVALUATION OF WECK EDUCATIONAL DEVELOPMENT PROGRAM
DISPOSABLES MANUFACTURING GROUP

Directions: Place a check mark in the blank to mark your answer to each question. Use the headings below for each question.

		Always	Mostly	Sometimes	Seldom	Never
1.	Did you like the class?	___	___	___	___	___
2.	Did you learn from the class?	___	___	___	___	___
3.	Was the teacher helpful?	___	___	___	___	___
4.	Was the class interesting?	___	___	___	___	___
5.	Can you use what you learned on the job?	___	___	___	___	___
6.	Was the class long enough?	___	___	___	___	___
7.	Has the class made you want to learn more?	___	___	___	___	___
8.	Did the class help you get to know and like co-workers better?	___	___	___	___	___
9.	Did the class give you a better overview of the company?	___	___	___	___	___
10.	Did the class help you understand and appreciate your supervisor's job?	___	___	___	___	___
11.	Are you using the Specifications more since this class began?	___	___	___	___	___

	Always	Mostly	Sometimes	Seldom	Never
12. Are you more comfortable with helping others learn something new to them after taking this class?					
13. Do you feel more comfortable about taking tests after taking this class?					
14. Have you learned words used in this business that you didn't know before?					
15. Do you pay more attention to machine settings after taking this class?					
16. Do you feel more comfortable with math after taking this class?					
17. Did you learn anything new about completing forms?					
18. Do you feel more comfortable about the idea of cross-training?					
19. Would you like to have more classes like these?					

FINAL DAY OF CLASS EVALUATIVE WRITTEN COMMENTS IN RESPONSE TO WRITTEN QUESTIONS - LOIS' GROUP

HOW COULD THE CLASS HAVE BEEN BETTER?

I think it was ok.
Better organized.
The classes need to be extended. So much of what we learned in school has been forgotten.
I can't see anything I would have done different
Two time a week.
Need more time on the work orders
Have more work for us to learn and do on paper.
The class would have been better if we had more time to stay in it.
Having people really interested and enjoyed what they learned.
The classes were good. Well planned. And helpful for most part.
Classes were O.K. But some needed it more than others.
There could have been more to learn.
Giving more classes on something that a lot of them did not understand.
Very good
The class was fine
I like it the way it was.
It was find
It could have been longer.

WHAT WAS YOUR FAVORITE PART OF CLASS?

All of it was interesting
Giving and following instructions and the paperwork.
Working with Lego
Everything. test, Reading gauges, Reading the spec, math, communications
Working with math and listening to you discuss things about our work and lessons in life.
Learning about reading gauges.
Giving directions and being able to follow directions.
The written work and discussions.
Movies
All of the classes.
All was good
Math
Reading the speck.
I enjoyed it all
The bucket
I like everything.

WHAT DID YOU DISLIKE MOST ABOUT CLASS?
Nothing I enjoyed it learned a lot from it.
The class was good overall. There was nothing to dislike
The time. (Too early)
Math
I like the class very much.
I liked the class, don't know of any part I disliked
Not enough time
I enjoyed all of the different test at the end to see what I did learn
I'm not use to a laid back atmophere. An hour and a half some long until you got busy.
Math
Some try to the best & make rest look stupid. That is the case all the time
I like it all
Having classes in mornings
Early in the morning
Not anything
Everthing was find
I dislike nothing about the class

HOW CAN THE TEACHER IMPROVE NEXT TIME SHE TEACHES A CLASS?

I thought she did a very good job.
Have more information on specific items she or he is planning to discuss in the class.
I think she done a great job
I don't know. She was "good."
I feel like she done the best she could for the time she had.
I seen nothing necative about the teacher.
I enjoyed the class. I don't know if I would change it.
Make different in some things
You did a very good job. Need no improvement
Did good
The teacher doing a good job
You did a good job I think.
She was very good
You did a good job
Have more time.

FINAL DAY OF CLASS EVALUATIVE WRITTEN COMMENTS IN RESPONSE TO WRITTEN QUESTIONS - MOJDEH'S GROUP

HOW COULD THE CLASS HAVE BEEN BETTER?

I don't think it could have been any better.
I thought the class was just fine the way it was.
I thought the class was good as it was
If we could have have them twice a week.
Not long another
It could have been longer.
More room at the beginning (crowded). A little more oral presentation by the whole class in front of their peers.
It could not have been better
Have more times for the class time you get start the 2 hr. was over
The class can if possible be a little longer for individual to talk to teacher after each topic.
For the class to last longer. You would have more time to do the class
Be more organized while doing activities.
Class was fine.

WHAT WAS YOUR FAVORITE PART OF CLASS?

Every part was interesting.
Doing different activity & games.
Awaking me to math skill I donot like math.
Learning about the different spects
Yourly the paper work. The bucket system of inventory.
Playing the bucket game.
Words and thier meanings. Tests.
I enjoyed it all
Reading gauges.
My favorite part of class was following instructions.
Math. I forgot a lot of things. But when I was in school, it was my favorite.
I really enjoyed it all.
Individual participation.

WHAT DID YOU DISLIKE MOST ABOUT CLASS?

Nothing
I thought the class was very interesting.
I like the class
every thing was alright
nothing
Not enough time.
I can not think of any one particular thing.
Reading specifications and find answer to question
There was nothing that I dislike about the class
The class was excellent. How can you dislike someone who is trying to help.
I can't say I dislike any of it. At first I didn't even want to participate. But, after I got started I thoroughly enjoyed everything.
Nothing particularly.

HOW CAN THE TEACHER IMPROVE NEXT TIME SHE TEACHES A CLASS?

Keep doing what she's doing. I can't think of anything. It went well.
She taught the class very well.
Don't give as much paperwork.
Learn about different work in every department. Because all job is different. And the spect or to.
Nothing.
Have more participation by Individual members of the class
Have more times and spend times with each group in case you have any question
You are a good teacher and you do not have to improve
I think the teacher did an excellent job in teaching the class.
She doesn't need any improvement. You can't get any better then EXCELLENT - THE BEST.
No improvement. She did an excellent job.
None. Did a good job.

OTHER COMMENTS

I enjoyed listen to you explain thing's. some of the paper work I didn't unstand. Most of the class's I liked. Good luck and Thank you.

UNIT 2

INSTRUMENTS

JOB TASKS ANALYSES

INSTRUMENTS

Literacy Task Analysis - Instruments Work Cell

The following literacy tasks are required of members in the Instruments Work Cells.

Task	Literacy Competency	Achieved By
I. Each member must be competent in the following		
A. Contributing to meetings and to team efforts.	A. 1. Effective listening 2. Understanding and using the Circle of Communication 3. Effective Speaking 4. Group problem-solving 5. Understanding silent communicators	A. 1. Teamwork classes. Team meetings. 1-5. Video taping meetings and reviewing individually with ed. coordinator. Each person will view 2 meetings with time in between to master skills needed to improve performance.
B. Training one another for tasks.	B. 1. Following oral instructions 2. Giving oral instructions 3. Asking clarifying questions 4. Describing one's duties 5. Describing safety procedures 6. Identifying tools and tasks in the cell as well as technical terms	B. 1-3. Topics covered in teamwork class. 4-5. Video taping cell members describing their tools, tasks, and relationship to other operations. 6. Completing appropriate sections in workbook on identifying tools and terms used in the cell.
II. CNC Operation		
A. Calling up appropriate program number for operation as indicated on the blueprint.	A. 1. Cross-referencing letters and numbers. 2. Following instructions from diagrams and documents 3. Basic general understanding in order to monitor computer screen.	A. 1-3 Completing appropriate sections in the workbook as indicated by pre-testing.

Task	Literacy Competency	Achieved By
B. Using calipers to measure jaw width. Comparing measure to blueprint. Checking for tolerance specifications.	B. 1. Measuring with calipers 2. Adding and subtracting to 4 decimal places, including negative numbers. Recognizing whether measurement falls within tolerance.	B. 1. Class. Hands-On practice. Workbook. 2. Appropriate lessons on CCC system.
III. Rough Shape/Fine Shape Jaw		
A. Check rough jaw shaping with a gauge.	A. Use a template to guide rough shaping of jaw on bader.	A., B. Hands-on practice. Workbook exercises as needed.
B. Check final shape of jaw. Match with blueprint.	B. Compare/Contrast with a template.	
IV. Milling/Coining/Grinding		
A. Measure coin slot and scoop thickness with coin micrometer	A. Use a coin micrometer. Compare results to blueprint specifications. Identify as to whether coining and milling is in or out of specification. Add and subtract to 3 decimal places. Figure tolerances to .002 and .005 and recognize whether coining and milling is in or out of tolerance. Use info to set the travel of this machine feed.	A. Class. Hands-on practice. Workbook assignments as needed. Appropriate lessons on CCC system.
B. Follow blueprints, including manufacturing notes.	B. Read prints. Understand and interpret prints including notes. Locate appropriate information on a drawing and transfer to an instrument.	B. Classes. Workbook assignments as needed. Hands-on practive.

Task	Literacy Competency	Achieved By
V. Curving Instruments (H-A Cell Only)		
A. Check the blueprint to determine the size of curving fixture to use.	A. Locate appropriate information from a blueprint. Match curving angle with appropriate fixture.	A. Hands-on practice. Workbook assignments as needed.
B. Once the instrument is curved, check the angle of the curve with a protractor.	B. Using a plate protractor and reading the measurement. Transferring tolerance from print to actual measurement to decide whether curve is acceptable. Adding and subtracting whole numbers. Reading a gauge. Identifying less than, greater than values.	B. Hands-on practice. Workbook assignments as needed.
VI. FinalInspection/Packaging/Cell Leader		
A. Packaging - Closing out. 1. Close out production order. 2. Complete scrap report. 3. Check and complete route card. 4. Complete Clearance Sheet. 5. Make a move ticket on the computer.	A. 1-5 Complete forms and check for accuracy. Transfer numbers, codes, dates, and figures. 5. Use a computer keyboard for a simple routine operation.	A. 1-5 Class. Hands-on practice. Workbook.
B. 1. Overseeing materials, scheduling and maintenance 2. Planning	B. 1. Completing forms for work orders, inventory transfers, supply requisitions. 2. Using a computer to look at inventory information and to get blueprints when needed. Arranging events in logical sequential order	B. Peer tutoring.

Task	Literacy Competency	Achieved By
VI. Final Inspection/Packaging/Cell Leader (Cont'd)		
C. Serving as group liaison to management.	C. Oral communications - Asking clarifying questions - Describing problems - Using appropriate terms, knowledge of all task and tools	C. Classes. Peer tutoring. Workbook assignments as indicated by pre-test.
D. Serving as group mediator, motivator and coach.	D. Oral communications - Able to identify - Causes of problems - Able to distinguish fact from opinion - Able to use appropriate terms - knowledge of all tasks and tools	D. Classes. Video. Workbook.

PRETEST RESULTS

INSTRUMENTS

RESULTS OF INSTRUMENTS PRETEST

SKILLS IDENTIFIED AS IMPORTANT FOR CROSS-TRAINED CELL MEMBERS

Test given to 6 potential members of Cell 2

Skill to be measured	Percent of team answering most questions correctly
Matching terms found in Specs with definitions	0%
Naming tools and machines in cell	66%
Reading charts and graphs	90%
Finding errors in common paperwork	90%
Measuring with calipers and micrometers	50%
Identifying measurements within tolerance	50%
Reading a blueprint	33%

MEASUREMENT TOOLS

INSTRUMENTS

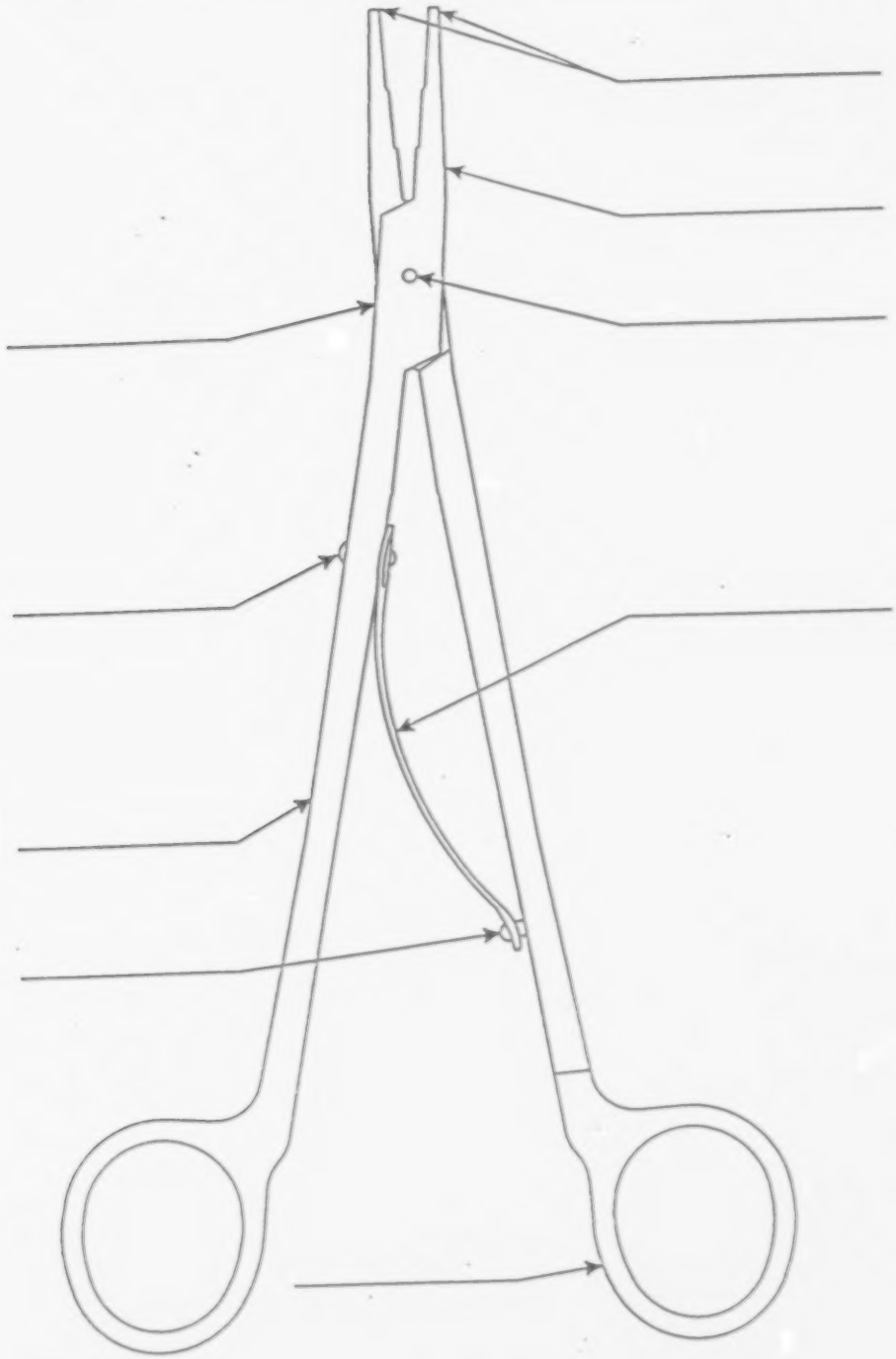
NAME_____ DATE_____

NEW CELL

TRAINING PLANNER

PLEASE ANSWER THE FOLLOWING QUESTIONS AS WELL AS YOU CAN. WE DO NOT EXPECT EVERYONE TO GET EVERY ANSWER CORRECT. YOUR RESPONSES WILL HELP US INDIVIDUALIZE YOUR TRAINING PLAN.

Typical Ring Handled Instrument



Write the correct term from the following list on the line coming from the corresponding part on the instrument drawing. Notice that some of the listed words are not used.

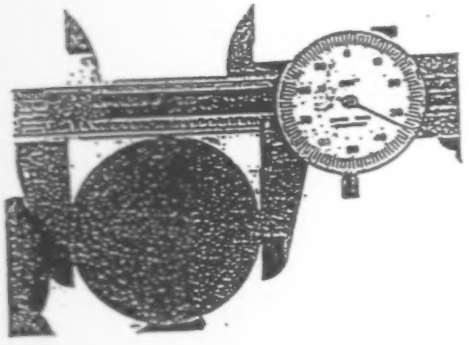
Rivet	Flag	Spring
Ring	Shank	Box Rivet
Box	Tips	Jaw

Match the correct definition with each term. Write the letter of the correct definition in the blank beside each term.

___ 1. diameter	a. the control of roughness by turning, grinding, milling, or lapping
___ 2. countersink	b. to remove a sharp edge or corner caused by a machining process
___ 3. jig	c. to shape in a mold or die
___ 4. fixture	d. to put into motion (engineering term)
___ 5. broaching	e. a device that holds workpieces and aligns them with the tool or machine axis with repeatable accuracy
___ 6. seat	f. a funnel-shaped enlargement at the outer end of a drilled hole
___ 7. downstream operations	g. the length of any straight line going through the center of a circle
___ 8. actuate	h. later stages of the manufacturing process
___ 9. coin	i. the allowance of acceptable error within which the mechanism will still fit together and be totally functional
___ 10. deburr	j. a method of metal working in which the metal is forced into the desired shape by hammering or by pressure--heat may be used
___ 11. bushing	k. the process of removing unwanted metal by pulling or pushing a tool through the workpiece
___ 12. buffing wheel	l. to fit an object correctly onto a surface which was made for the object to rest upon
___ 13. finishing	m. a hollow cylinder that is used as a spacer, a reducer for a bore size, or for a bearing
___ 14. forging	n. particles used for grinding wheels--may be diamond dust, aluminum oxide, or silicon carbide
___ 15. grit	o. a device that guides a cutting tool and aligns it to the workpiece
___ 16. tolerance	p. a disk made up of layers of cloth sewed together--fine abrasive applied to the wheel provides a polishing surface

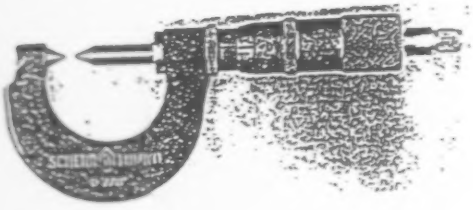
Use the following names of tools and machines to label the pictures on the next three pages:

milling machine
file
drill press
fixture
punch
calipers
broaching tool
micrometer
protractor
CNC (Computer Numerically Controlled) machine

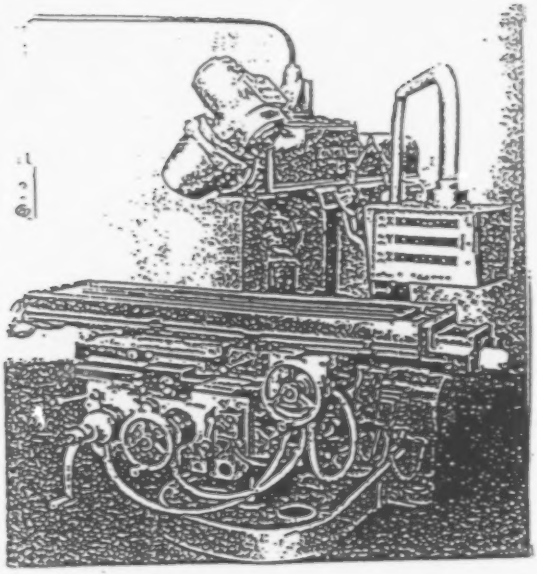


1. _____

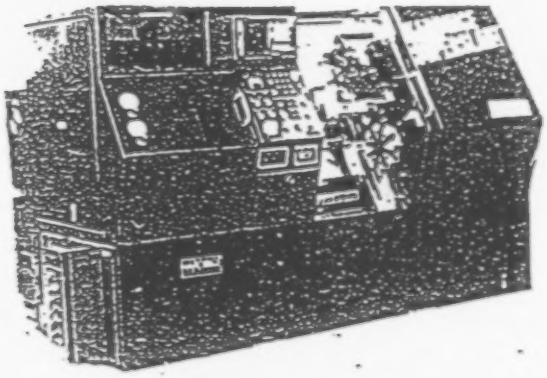
2. _____



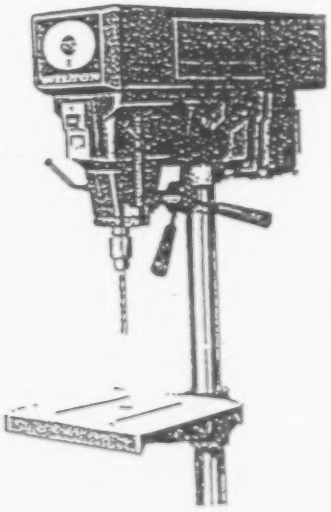
3. _____



4. _____



5. _____



6. _____

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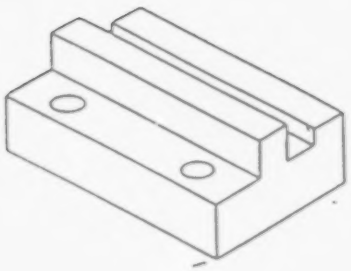
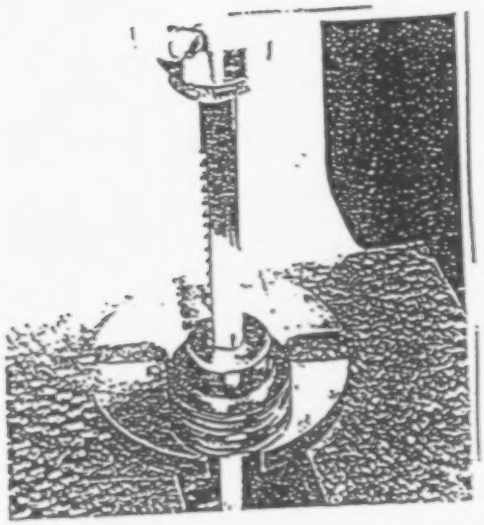


7. _____



8. _____

9. _____

10. _____

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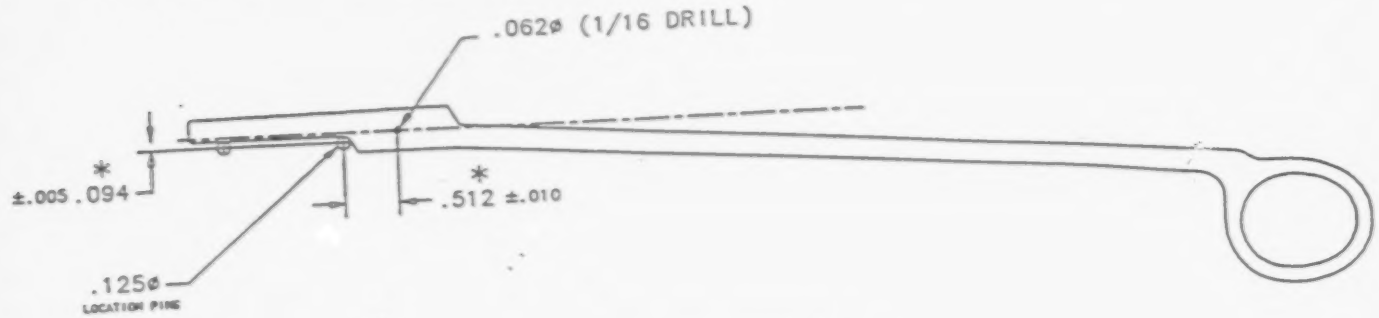
Use the drawing to answer questions 1-7.

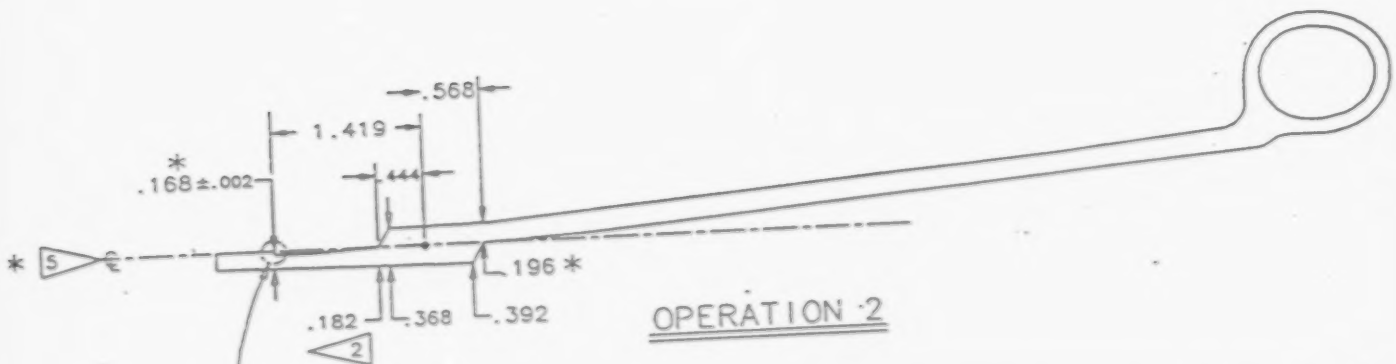
NOTES:

1. MATERIAL: FORGING CK0208. DWG 1S0009291
2. MACHINED SURFACES MUST BE PERPENDICULAR TO BOX THICKNESS WITHIN .003. TYPICAL FOR JAW AND BACK SHANK ALONG CONTACT AREA.
3. .010 MAXIMUM DIFFERENCE IN BOX WALL THICKNESS.
4. .005 MAXIMUM DIFFERENCE IN THE MACHINED CUTOUTS.
5. LOCATED WITHIN ±.005 OF ACTUAL FORGING CENTERLINE.
6. USE CNC PROGRAM NUMBER 3166
7. * INDICATES INSPECTION DIMENSION.

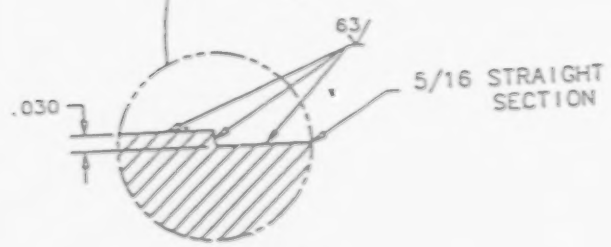


OPERATION 1

DRILL FIXTURE
DWG: 250005000



OPERATION 2



DETAIL A

JAWSTEP

TOLERANCES EXCEPT AS SHOWN
.X ± .1
.XX ± .01
.XXX ± .005
ANGLES IN DEGREES ± 1°

1. Which CNC Program Number is used to machine this applier? _____
2. What size drill bit is used to drill the box locating hole? _____
3. The distance from the jawstep to the box locating hole is 1.419. The distance from the box locating hole to the end of the box is .444. What is the distance from the end of the box to the jawstep? _____
4. How deep is the jawstep? _____
5. What is the minimum allowable depth of the jawstep? _____
6. What is the maximum allowable depth of the jawstep? _____
7. How is an inspection dimension identified? _____

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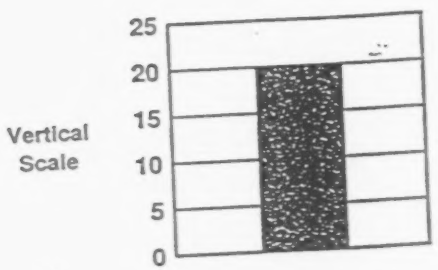
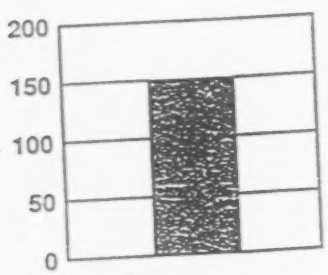
Reading Vertical Bar Graphs

Bars often represent numbers or amounts. Bars that run up and down are called vertical bars. Lines that mark the length of the bars are called vertical scales.

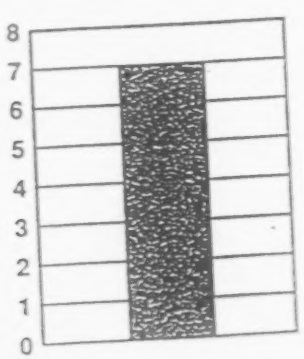
▶ Use the vertical bars to answer the following questions.



1. What number is represented by the vertical bar? 20

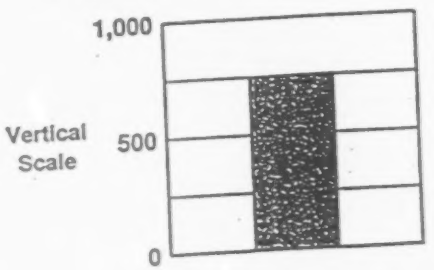


2. What number is represented by the vertical bar? _____

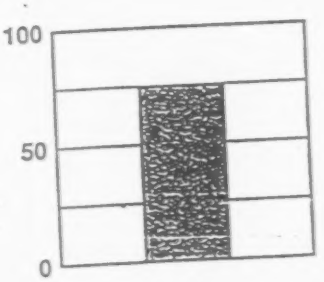


3. What number is represented by the vertical bar? _____

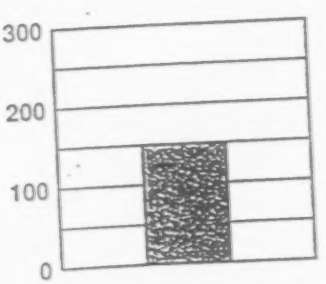
▶ Remember that some bars may stop on lines that are not labeled. Use the numbers that are given to find the missing values.



4. What number is represented by the vertical bar? _____

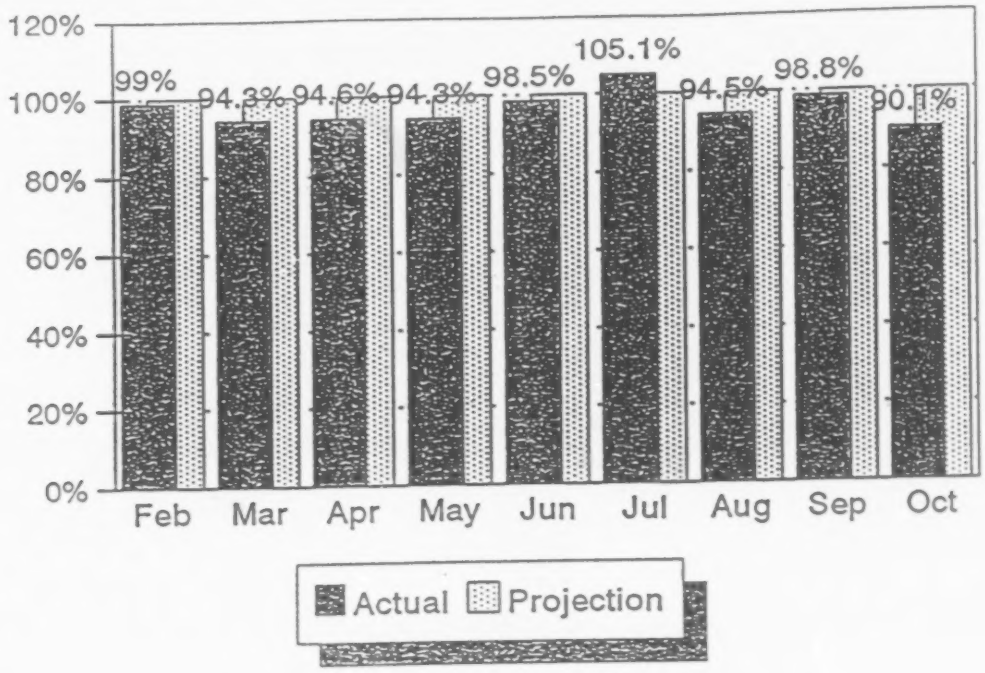


5. What number is represented by the vertical bar? _____



6. What number is represented by the vertical bar? _____

Total Weck Sales vs. Projection



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Use the vertical bar graph to answer the following questions.

1. Name the month (s) in which sales were greater than 100 % of projection.

_____

2. Name the month (s) in which sales were less than 95 % of projection.

_____

3. Look at the months July - October. Rank them from highest to lowest in meeting projected sales.

(a) _____ (c) _____

(b) _____ (d) _____

4. What percentage difference is there between the month with lowest sales and the month with highest sales?

_____

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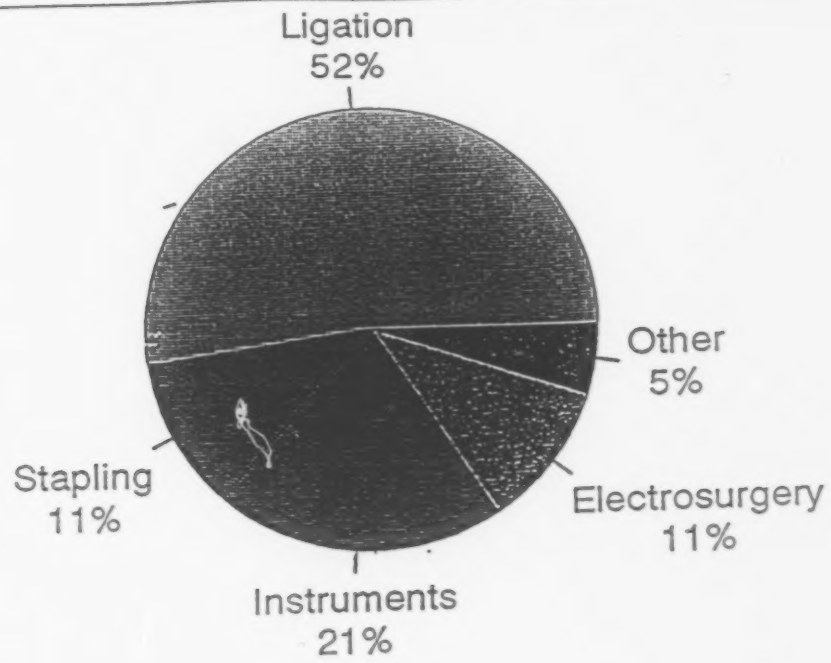
Weck Products

Three Average Days



By Dollar Sales

Use the pie chart to answer the following questions.

1. **In one sentence, describe what information this pie chart gives us.**

2. **State one <u>fact</u> from this pie chart.**

3. **Going a step further, what is one conclusion you might draw from looking at the chart?**

4. **What 2 categories add up to 22%?**

5. **Instruments and Other brought in half the dollar sales of what category?**

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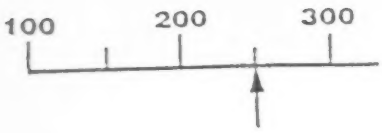
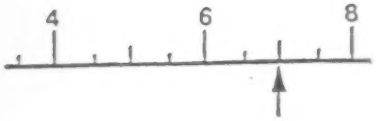
4. 

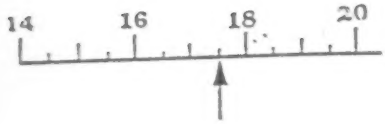
a. The numbers written on the scale go up by (Check one)—
☐1's ☐2's ☐5's ☐10's ☐20's ☑100's

b. The arrow points to the mark that means _____

5. 

a. The numbers written on the scale go up by (Check one)—
☐1's ☑2's ☐5's ☐10's ☐20's ☐100's

b. The arrow points to the mark that means _____

6. 

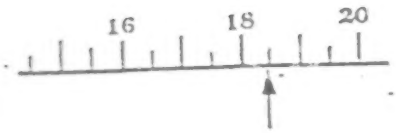
a. The numbers written on the scale go up by (Check one)—
☐1's ☑2's ☐5's ☐10's ☐20's ☐100's

b. The arrow points to the mark that means _____

7.

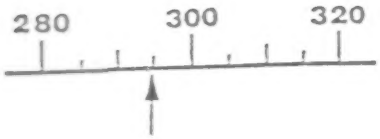
a. The numbers written on the scale go up by (Check one)—
☑1's ☐2's ☐5's ☐10's ☐20's ☐100's

b. The arrow points to the mark that means _____

8. 

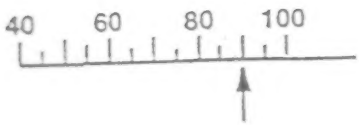
a. The numbers written on the scale go up by (Check one)—
☐1's ☑2's ☐5's ☐10's ☐20's ☐100's

b. The arrow points to the mark that means _____

9. 

a. The numbers written on the scale go up by (Check one)—
☐1's ☐2's ☐5's ☑10's ☐20's ☐100's

b. The arrow points to the mark that means _____

10. 

a. The numbers written on the scale go up by (Check one)—
☐1's ☐2's ☐5's ⊙10's ☐20's ☐100's

b. The arrow points to the mark that means _____

Reading Practices at Work

Please circle the number which best describes you in the situations below:

(1) You just listen in team or department meeting discussions.
very like me 1 2 3 very unlike me

(2) You talk a lot in team or department meetings, asking questions or sharing ideas.
very like me 1 2 2 very unlike me

(3) Your ideas are often discussed in team or department meetings.
very like me 1 2 3 very unlike me

(4) You wait for others to talk about written information, just to be sure what is in it.
very like me 1 2 3 very unlike me

(5) You look for printed directions to help figure out what to do when a problem arises.
very like me 1 2 3 very unlike me

(6) You often have trouble reading paperwork from management.
very like me 1 2 3 very unlike me

(7) When the booklet about new health benefits arrived, you read it carefully.
very like me 1 2 3 very unlike me

Practices at Home

Please check the number of times you have done the following:

1. In the last 7 days, how many times have you used a TV guide listing to select programs?

1	2	3	4	5	6	7	8	9	10+

2. In the last 7 days, how many times have you read a newspaper?

1	2	3	4	5	6	7	8	9	10+

3. In the last 7 days, how many times have you read a magazine?

1	2	3	4	5	6	7	8	9	10+

4. In the last 7 days, how many times have you read a book for pleasure?

1	2	3	4	5	6	7	8	9	10+

QUALITY COSTS

What does the term "Quality Cost" mean?

It means the costs (or losses) associated with providing a product or service with poor quality. Quality costs include internal failure costs, external failure costs, appraisal costs, and prevention costs.

How do you know what is good quality or poor quality?

Good quality vs. poor quality is determined by a number of factors including customer expectations and perceptions, product life, product specifications and performance requirements, and safety. If a product meets all of the above requirements, it is sure to have good quality. If a product meets all of the internal requirements and specifications, and is safe, it may not be considered a good quality product if it doesn't meet the customers expectations.

What are some of the costs?

Internal failure costs:
- Scrap
- Rework
- 100% sorting
- Reinspection, retest
- Avoidable process losses
- Downgrading

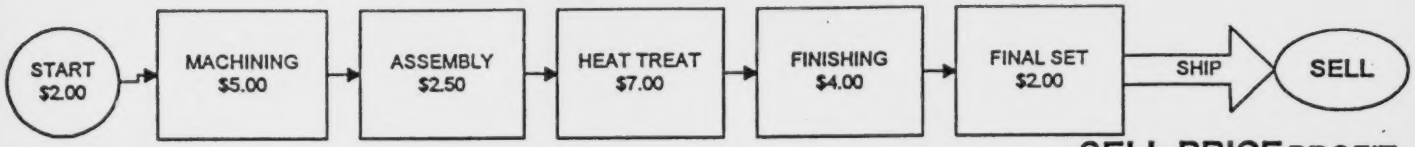
External failure costs:
- Warranty charges
- Complaint adjustments
- Returned material
- Allowances

Appraisal costs
- Incoming inspection and test
- In-process inspection and test
- Final inspection and test
- Product quality audits
- Maintaining accuracy of test equipment
- Inspection and test materials and services
- Evaluation of stocks

Prevention costs
- Quality planning
- New products review
- Process planning
- Quality audits
- Supplier quality evaluation
- Training

COST OF QUALITY

MANUFACTURING PROCESS



COST						SELL PRICE	PROFIT
$2.00	$7.00	$9.50	$16.50	$20.50	$22.50	$30.00	$7.50
	Problem	Problem discovered					
	Problem				Problem discovered		
2		9.50	16.50	20.50	~~22.50~~		
24.50	29.50 ~~31.50~~	32 40	39 ~~56.50~~	43	45	30	~~(-15~~
	Problem				Problem discovered Must be scrapped		
				Problem			

HEAT TREAT TRAINING PLANNER

Reading Comprehension

For the following questions, refer to the Specification #14-2-00797.08 entitled Furnace Operations, Heat Treating.

1. What is the purpose of this specification?

2. What actions should you take if the hydraulic clamp pressure gauge reads 900 psi?

3. What is the program number for burnout?

4. How often do you run a burnout cycle?

5. What is the acceptable hardness range for 420 SS?

6. What is step 8.3.5 of the Emergency Furnace Shutdown Procedure?

Reading Comprehension

7. In the event that water pressure drops below a safe level, what indication will the operator receive?

8. What temperature should the diffusion pump heater gauge reach before the furnace is ready?

9. When degreasing instruments, for about how long do you ultrasonically treat the instruments?

10. What is the minimum nitrogen pressure you should have before starting the furnace?

Tolerancing

1. When heat treating 17-7 stainless steel for temporary occlusion clips, you place the clips in an oven preheated to 1390 +/- 25°F for an hour and a half. What are the maximum and minimum acceptable temperatures?

   Maximum _____

   Minimum _____

2. When heat treating micro-clip bodies, you heat them to 1390 +25/-10 degrees F for 1.5 hours. Circle the temperatures below which are out of specifications.

1410°F	1375°F	1417°F
1390°F	1380°F	1415°F
1420°F	1305°F	1400°F

3. After heat treating the clip bodies, you fan cool them to 100° F, then you refigerate them at 55 +/- 5 degrees F for 30 minutes. What are the maximum and minimum acceptable temperatures for the refrigerator?

   Maximum _____

   Minimum _____

4. After refrigerating the clips, you draw them at 1000 +25/-10 degree F for 1.5 hours. Circle the temperatures below which are within specifications.

1020°F	985°F	990°F
1005°F	1027°F	980°F

Reading Digital Control Programmer Worksheets

For the following questions, refer to the DCP worksheets at the back of specification #14-2-000797.08, Furnace Operation, Heat Treating.

1. How long does the burnout cycle last?

   _____Hours _____minutes

2. If you are 35 minutes into segment 5 of program 4, how many minutes remain until you reach segment 6?

   _____minutes

3. For the 410 Stainless program, what temperature should the oven be at during segment 9?

   _____°F

   How long should the oven be at that temperature?

   _____minutes

4. If you have 10 minutes left of segment five of the Annealing program, how much time remains until the whole program is complete?

   _____minutes

5. How long is the oven at 1400°F during the Annealing program?

   _____minutes

6. You are three quarters of the way through segment 5 of program 11. How much time remains until the program is complete?

   _____ hours _____ minutes

Reading Dials, Gauges and Charts

For the following four questions, refer to the to the chart on the next page which measures vacuum in microns of mercury (Hg). Look at the page sideways, so the letters and numbers are upright.

1. How many microns of mercury are represented by each space between the vertical lines which are between the lines labeled 10 and 20 microns?

_____

2. How many microns of mercury are represented by each space between the vertical lines which are between the lines labeled 30 and 50 microns?

_____

3. How many microns of mercury are represented by each space between the vertical lines which are between the lines labeled 50 and 100 microns?

_____

4. How many microns of mercury are represented by each space between the vertical lines which are between the lines labeled 200 and 1000 microns?

_____

For the following question, refer the chart which measures temperature in hundreds of degrees fahrenheit on the page after the next one . Look at the page sideways, so the letters and numbers are upright.

5. If the large numbers (1-4) on the right hand side of the page represent hours, how many minutes does each space between the lines between the lines labeled 1 and 2 represent? _____minutes

Dials and Gauges

6. What is the reading on the micrometer on page 9? Write your answer as a decimal.

_____"

7. What does the temperature gauge on page 10 read in degrees fahrenheit ?

_____°F

8. What does the pressure gauge on page 11 read in pounds per square inch (PSI)?

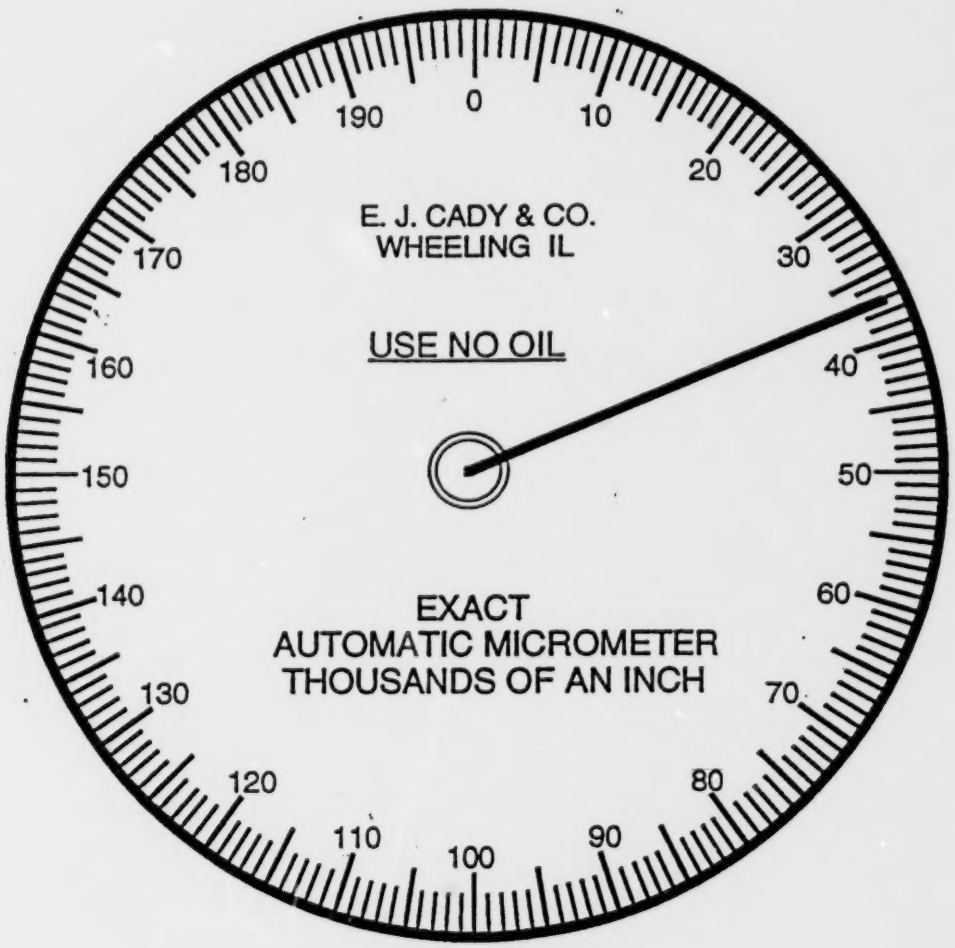
_____PSI

9. What does the temperature gauge on page 12 read in degrees centigrade?

_____°C

10. What does the micrometer on page13 read in inches? Write your answer as a fraction.

_____"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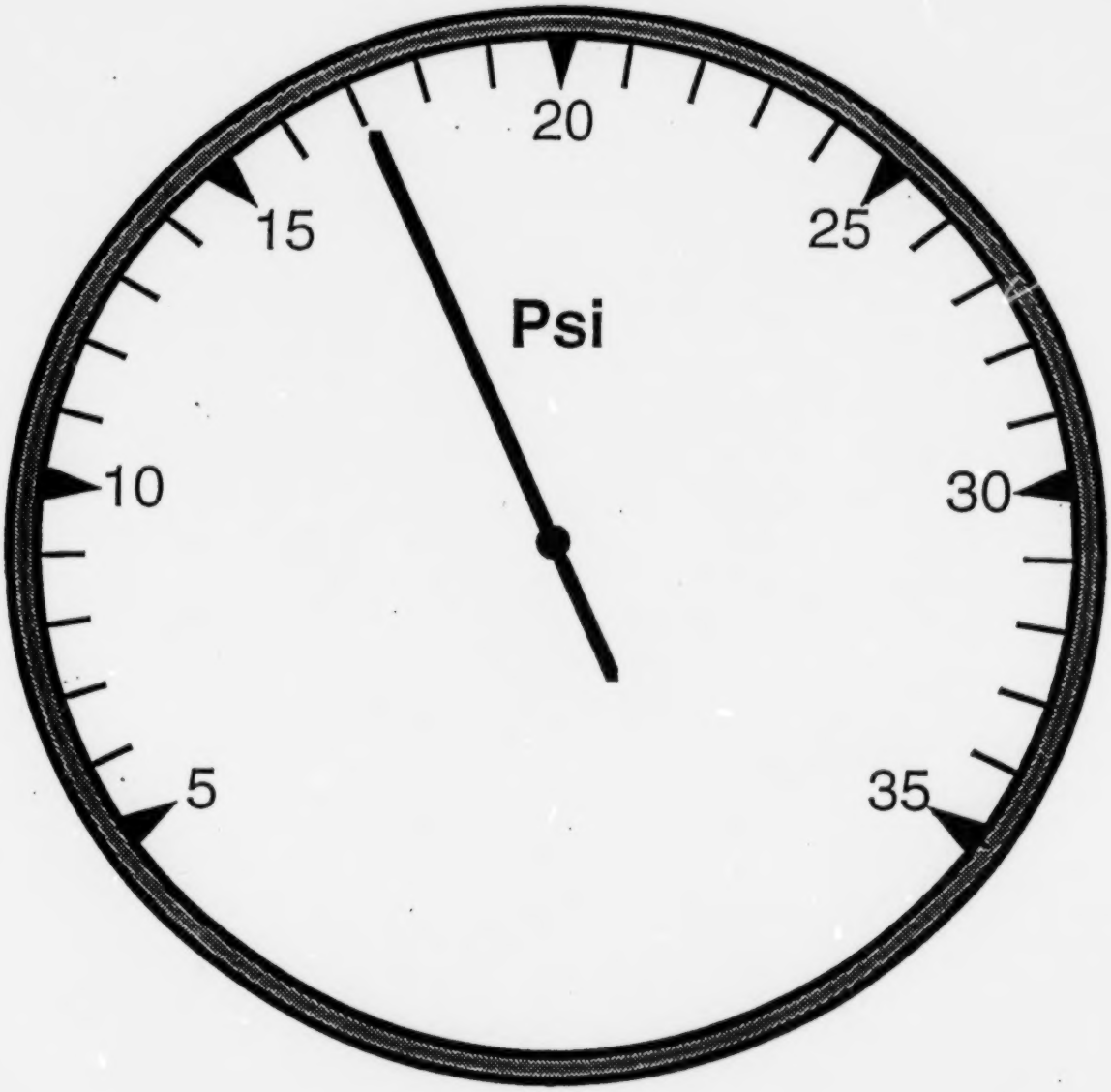
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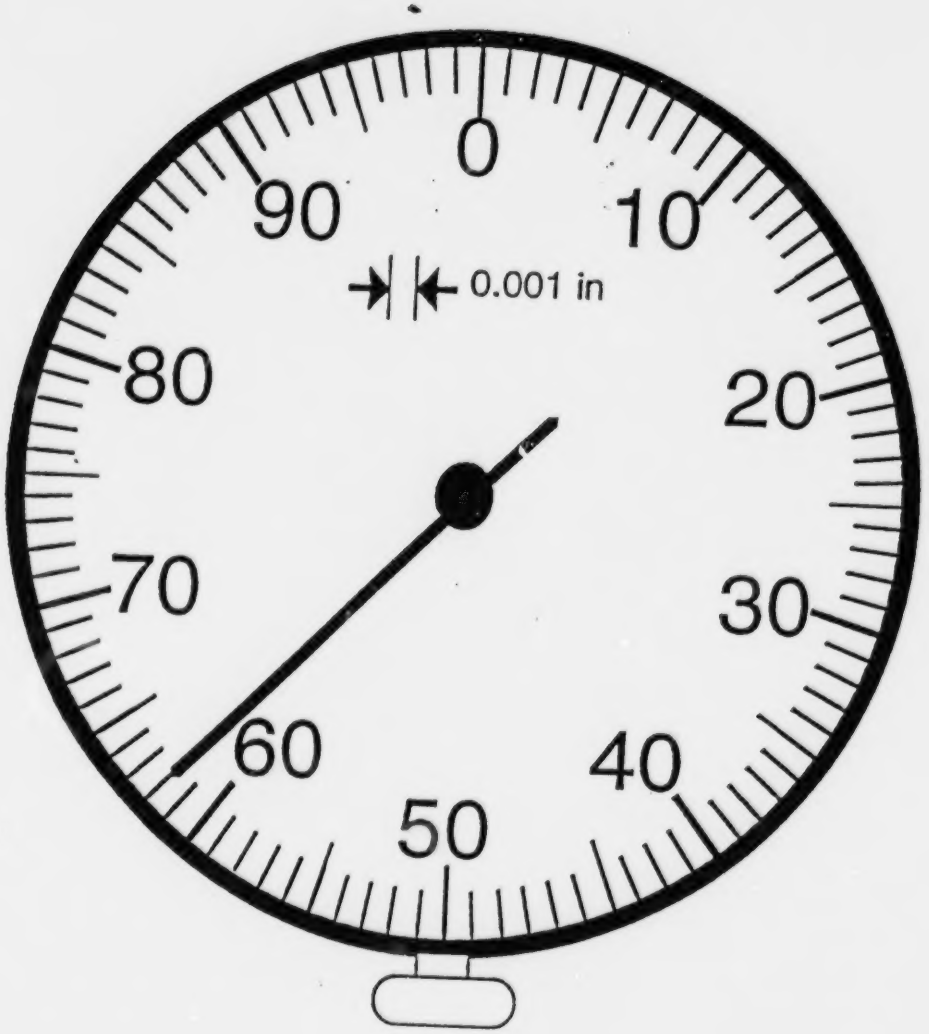

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UNIT 3

WAREHOUSE

JOB TASKS ANALYSES

WAREHOUSE

Warehouse Literacy Task Analysis

Task	Literacy Competency	Achieved By
General Competencies		
I A. Train new members for tasks.	I A. 1. Follow oral instructions. 2. Give oral instructions. 3. Ask clarifying questions. 4. Describe one's duties. 5. Listen and speak effectively.	I A. 1-5 Classroom communication training.
I B. Work together as a team to solve a problem.	I B. 1. Brainstorm. 2. Evaluate possible solutions. 3. Choose best alternative. 4. Come to a group consensus.	I B. 1-4 Classroom teamwork training.
I C. Recognize common tools, tasks, and technical terminology.	I C. 1. Describe safety procedures. 2. Identify technical terms. 3. Describe common job tasks.	I C. 1-3 Complete appropriate sections of the workbook as determined by pretest.
Warehouse Level 1 Competencies		
II A. Package orders for shipping.	II A. 1. Choose appropriate package. 2. Ensure customer address on label is the same as address on pick list.	II A. 1-2 Complete appropriate sections in workbook as determined by pretest.

Task	Literacy Competency	Achieved By
Warehouse Level 2 Competencies		
III A. Pick customer orders.	III A. 1. Scan pick list to obtain information. 2. Match six digit numbers. 3. Put letters and numbers into alpha-numeric order.	III A. 1-3 Complete appropriate section workbook as determined by pre-test.
III B. Open and close lots on computer.	III B. 1. Follow sequential directions 2. Enter information via keyboard.	III B. 1-2 Complete appropriate section in workbook as determined by pretest.
III C. Check orders.	III C. 1. Match catalog numbers. 2. Count and confirm order quantity.	III C. 1-3 Complete appropriate sections of the workbook as determined by pretest. Do computer lessons as needed.
III D. Print out and sort pick lists.	III D. 1. Scan pick list for information. 2. Note special directions. 3. Prioritize orders by urgency.	III D. 1-3 Complete appropriate sections in workbook as determined by pretest.
III E. Operate shrink wrap machine.	III E. 1. Operate control panel. 2. Read analog temperature gauge. 3. Recognize out of specification temperature reading.	III E. 1-3 Complete appropriate sections in workbook as determined by pretest. Do assigned lessons on computer.

Task	Literacy Competency	Achieved By
Warehouse Level 3 Competencies		
IV A. Use scanner to start and close lots.	IV A. 1. Follow sequential directions. 2. Familiarize oneself with scanner limitations. 3. Operate keypunch pad.	IV A. 1-3 Attend hands-on scanner training session.
IV B. Operate pick list printers.	IV B. 1. Follow sequential directions. 2. Turn on printer. 3. Thread printer.	IV B. 1-3 Attend hands-on printer training session.
IV C. Drive a forklift.	IV C. 1. Read and understand operator's manual. 2. Read and understand safety decal. 3. Fill out forklift inspection card.	IV C. 1-3 Attend semi-annual forklift training. Complete appropriate sections of workbook as determined by pretest.
IV D. Pick serial number control items.	IV D. 1. Match numbers. 2. Follow sequential directions.	IV D. 1-2 Attend classroom training on lot numbering system.

Task	Literacy Competency	Achieved By
Warehouse Level 3 Competencies		
IV E. Operate computerized shipping equipment.	IV E. 1. Operate Pitney/Bowes/ UPS system. 2. Operate Roadway Easy-Bill system. 3. Operate Federal Express system. 4. Enter information using keyboard. 5. Follow sequential directions.	IV E. 1-5 Attend hands-on computer training.
IV F. Upload shipping data to AS400	IV F. 1. Familiarize oneself with scanner. 2. Follow sequential directions. 3. Enter data using keypunch pad.	IV F. 1-3 Attend hands-on scanner training.
IV G. Download scanner data into AS 400.	IV G. 1. Familiarize oneself with scanner. 2. Follow sequential directions. 3. Enter data using keypunch pad. 4. Enter data using keyboard.	IV G. 1-4 Attend hands-on scanner training.
IV H. Pick, pack, and ship international orders.	IV H. 1. Compare numbers to ensure accuracy. 2. Compare addresses for accuracy. 3. Reference material to ensure correct postage.	IV H. 1-3 Complete appropriate section of workbook as determined by pretest.

Task	Literacy Competency	Achieved By
Warehouse Level 3 Competencies		
IV K. Warehousing raw material components.	IV K. 1. Locate stack using alphanumeric code.	IV K. 1 Attend classroom on lot numbering system.

PRETEST

WAREHOUSE

Warehouse Pretest Results

Category	Percent Correct
Reading Comprehension	71%
Problem Solving	62%
Filling out forms	91%
Matching six digit numbers	*54*
Multiplying/Adding whole numbers	88%
Reading Bar Graphs	86%
Reading Pie Charts	52%

CURRICULUM

WAREHOUSE

WAREHOUSE CURRICULUM

The initial phase of training in the warehquse will consist of 6 one and one half hour long classes. The goal of the initial phase is to bridge the immediate gap between the workers' skills and the job requirements which was uncovered during the needs assessment. The following topics will be covered:

1. Communications Skills. This class will cover the difficulty of accurate communication, and how to respond to various communication styles. Activities will include building a structure based on the verbal direction of others, and role-playing a dispute between workers.

2. Teamwork Skills. This class will emphasize the importance of teamwork. Ideas about teamwork and contextual examples of good and bad teamwork will be solicited from the workers. The round table discussion may be supplemented by teamwork oriented role-playing games.

3. Inventory Control and the Accounting System. This class will drive home the importance of following inventory control procedures. The accounting bucket game, a visual model of how the accounting system works, will be used to show how the inventory control and accounting systems depend on each other.

4. Piling Product Identification. This class will introduce the catalog numbering system used by Piling, the company that just purchased Weck.

5. FIFO and the Stock Locator System. This class will provide an overview of the First In First Out method of inventory control and the stock locator system.

6. The Lot Numbering System and Recall Procedure. This class will cover lot numbers and how they are used to recall products. This class is being taught in anticipation of stricter regulatory requirements regarding the lot numbering system.

Status of the Warehouse Unit

Warehouse personnel are halfway through a series of classes designed to meet their on the job educational needs. Thusfar, classes included communication skills, problem solving, inventory control, the accounting system, and the company system of product identification.

Purchase of the company and a subsequent moving of stock to the Research Triangle Park complex have delayed the completion of this unit.

CELL SURVEY

Cell 1 Survey

		Percentages responding:
1. How can I be an effective team member?		
	Important	87.5
	Before start up	75.0
	New team	62.5
2. What are some problem-solving methods teams can use?		
	Important	100.0
	Before start up	50.0
	New team	62.5
3. What safety knowledge do I need to have about my cell?		
	Important	75.0
	Before start up	62.5
	New team	62.5
4. What do I need to know about reading blue-prints and drawings?		
	Important	100.0
	Before start up	62.5
	New team	75.0
5. What are tolerances and how are they controlled?		
	Important	87.5
	Before start up	50.0
	New team	75.0
6. How should conflict be resolved in teams?		
	Important	87.5
	Before start up	62.5
	New team	50.0
7. What is "continuous improvement" and how can we achieve it?		
	Important	87.5
	Before start up	12.5
	New team	75.0
8. How can we conduct effective team meetings?		
	Important	87.5
	Before start up	62.5
	New team	87.5

9. What is the best way for me to teach others my job, and how much do they need to know?

Important	75.0
Before start up	50.0
New team	75.0

10. What ground rules should we set for our team and how do we go about deciding on these rules?

Important	100.0
Before start up	50.0
New team	75.0

11. What should be the role of the team leader?

Important	87.0
Before start up	37.5
New team	62.5

12. What math do I need to brush up on in order to learn something about others' jobs?

Important	37.5
Before start up	12.5
New team	37.5

13. What quality checks do I need to know about to appreciate or learn others' jobs?

Important	62.5
Before start up	75.0
New team	75.0

14. What are the names of some of the tools used and tasks performed by others in my cell?

Important	87.5
Before start up	37.5
New team	75.0

LEADERSHIP SEMINAR

A leadership seminar is being conducted or group leaders in manufacturing and distribution. Purposes are to help group leaders become better critical thinkers and problem solvers as a result of their broader understanding of the company.

Thusfar, the seminar has included an overview of engineering, an introduction to new products planned for production, a tour of the warehouse and unfamiliar areas of production, information on materials management, a company overview, and a session on trusting relationships.

PARTICIPANT EVALUATION OF THE LEADERSHIP SEMINAR

Participants were asked to give their opinions on the following questions. They were asked to use a rating scale of 1=poor, 2=barely acceptable, 3=fair, 4=good, and 5=excellent. The average scores for the 11 participants are listed.

1. In general, the leadership seminar has been 4.5.

2. The amount of information I learned about the company has been 4.8.

3 Give your opinion of the value of each topic to you as a group leader.

Engineering	4.4
Manufacturing & Operations	4.4
Tour of Facilities	4.2
Quality	4.4
Presentations by Participants	4.0
Finance	4.0
Sales	4.9

4. How have you been able to use what you have learned?
(Comments are grouped by number of respondents.)

I better understand the big picture.	5
Know who to contact when I need something.	3
New awareness of importance of quality, lead time	3
Being able to explain the larger picture to others	3
Looking at data through graphs	1
I realize everyone has their own problems	1

5. How might we improve the seminar?

Do not need to change anything	6
Have the seminar after work hours	1
Give this information to all the people	1

MAJOR RESULTS

Major Results

Goal 1: Continue a workplace literacy program that attracts workers who have been hesitant to participate in training by removing barriers that have prohibited their participation previously.

Finding: Of the 36 individuals enrolled in the original pilot project, 11 received GED certification, and 10 continue to actively engaged in basic skills training. In the Weck Ed program, 81 individuals were served with 28 unduplicated individuals.

Objective 1: Increase the support of Weck Endoscopy management for the program by briefing all levels of management and supervisors about the program.

Finding: Personal interviews with management, supervisors, and project personnel revealed that the program did receive major support through continuous communication channels of personal visits, team meetings, brochures, and bulletin board displays.

Objective 2: Increase program support from all employees by briefing all levels of management and supervisors about the program.

Finding: Information for Objective 1 holds for this objective also. In addition, visits by project personnel and supervisors enhanced program support. Participants in the program also were instrumental in sharing with colleagues and encouraging their participation and support.

Objective 3: Enroll 25 more employees within six months.

Finding: Number of employees served in the twelve month period from June, 1993, to June, 1994, was 81 with 330 contact hours.

Goal 2: Continue a workplace literacy program that prepares workers for making the best use of new technology and new operating methods in order to increase job security and the likelihood of advancement and to maintain viability in the contemporary workplace.

Finding: While there was a time lag in the continuation of the pilot program because of delayed reception of approval to continue from the project grantor, the Weck Ed program has continued and enjoyed increased momentum throughout the organization.

While assessment of promotions has been difficult to attribute solely to the project, there have a number of promotions since the first phase of the current project. Also, management and supervisors reported increased interest in the job by hourly and wage employees, increased interest and skills in problem solving, and an increase in positive attitudes of participants about cross training and serving on teams.

Objective 1: Increase the involvement of plant personnel in developing training programs by including one administrator and two plant workers in curriculum and evaluation design activities.

Finding: Managers, administrators, supervisors, and plant employees have been actively involved in literacy task analyses, planning the curriculum, and in providing major feedback about the program to management, project personnel, and the outside evaluator.

Objective 2: Identify and analyze no fewer than 20 key job tasks for which the skill levels have increased as a result of technological changes.

Finding: Approximately 30 job tasks were analyzed and described which are resultant of technological change.

Objective 3: Individualize and customize the training curriculum by incorporating examples from each worker's job tasks in his/her training materials.

Finding: The project personnel were most successful in satisfying this objective. Basic adult training skills were integrated into each component of the program. Rather than teaching basic skills in reading, math, problem solving, and comprehension in the traditional modality, the project personnel developed diagnostic tests, planned class sessions, developed feedback instruments, and worked individually with participants using information and examples from job task manuals, information brochures, and actual behaviors on the line to individualize and customize the training for each participant.

Goal 3: Establish a workplace literacy program that encourages workers to continue participating in training needed to meet competitive chanllenges in the world market.

Finding: The Weck Ed program has fostered an enthusiasm and

drive among program participants to continue in a lifelong learning mode. Participants recounted their preferences and desires for future improvements because of their participation in the project.

Objective 1: Increase the information available to workers about changes in technology or operating processes.

Finding: The company has been active, even while undergoing revised ownership, in sharing and discussing technological innovations and work assignments throughout the work force.

Objective 2: Sponsor one conference on new technology and competitiveness for all program participants during the project.

Finding: There has been continuous involvement of program participants with respect to difusion of new technologies, team formation, and empowering of line workers due to a flatten administrative structure. Participants are most enthusiastic about increased involvement.

Objective 3: Update the Individual Development Plan for 50 percent of the program participants who complete the basic skills instruction to encourage them to continue their training.

Finding: There has been both oral and written feedback from project personnel to participants to encourage lifelong learning. Some participants have transferred this motivation to other family members and friends. The overall summary that was reported in interviews by many program participants was that "I only wish that I could have started this experience earlier".

Objective 4: Track program participants in other Weck Endoscopy sponsored training programs.

Finding: The organization has a tracking of program participants through records and experiences captured by management and supervisors and through computerized record keeping.

Goal 4: Provide individualized job-related basic skills instruction on a flexible schedule and to provide the supportive services necessary to assure participant success.

Finding: The creation of an Education Center at the work site

addresses a major portion of this goal. Also, individuals enjoyed the company benefit of being paid on a partnership basis for each hour spent in training in the Education Center for each hour they volunteered to be there. Also, basic skills training was provided on company time. Project personnel developed flexible schedules which met both company needs and changes and schedules of program participants.

Objective 1: Provide no fewer than one half of the workers with job-related basic workplace skills instruction and to achieve at least 65 percent successful completion rate as measured by the achievement of individual goals.

Finding: While the original proposed number of program participants among hourly and wage workers was to be 100 of the 300 workers in this category, company restructuring, change in ownership, and reduction of the size of the workforce resulted in 81 employees being served in the program.

Objective 2: Serve, on an open/entry--open/exit basis, 25 workers in the GED component of the program.

Finding: There were 28 unduplicated participants without a high school diploma in the program.

NUMBER OF EMPLOYEES SERVED BY WECK ED
6/93-6/94

LEARNING ACTIVITY	CONTACT HOURS	NUMBER SERVED	NUMBER WITHOUT HS
Adult Basic Ed.	96	3	3
GED Preparation	192	6	6
Work Cell Trng.	6	6	3
Disposables Class	12	40	20
Warehouse	6	15	2
Leadership Sem.	18	11	2
Total	330	81	28 unduplicated

CONTACT HOURS BY INSTRUCTOR

Hamilton - 184
Coplin - 134
Calto - 12

STATUS OF WORKERS WHO STARTED BASIC ED CLASSES IN 1991

Total originally enrolled	36
Still enrolled at Weck	7
Enrolled in GED college campus	1
Studying on own	2
Received their GEDs	11

RECOMMENDATIONS FOR PROGRAM CONTINUATION

Training Needs Yet to Be Met for Hourly and Wages Employees

1. 18 employees still lack high school diplomas.

2. Some workers in key positions cannot use measuring devices or identify tolerances.

3. Some workers in key positions cannot read prints.

4. All workers need to engage in learning periodically to keep their minds sharp and stay up to date with changing technology and increasing complexity.

5. Continue to foster a culture of learning and understanding each other to promote teamwork.

6. Continue to monitor the education center--enrolling participants, conducting back-ups on the CCC computers, ordering materials, and facilitating individual and group learning experiences.

7. Develop problem solving skills.

APPENDIX A

REVIEW OF PROPOSAL SPECIFICATIONS AND DIMENSIONS

One of the primary tasks in a formative evaluation of a program is to review the specifications and dimensions that were identified in the planning, design, and implementation of a program. While the proposal was successful, i.e., the proposal was funded, the need exists to ascertain what success will look like if the program is successful.

One means of critiquing a proposed program is to ask a number of questions: where is the program going?; how does it intend to get there?; how will I know that it is successful?; are there alternatives to this program?; and what are long-term effects of this program?

Questions that are of major importance for program sponsors and stakeholders include:

- How can the program be improved?
- How can the program become more efficient or effective?

Questions that are of major importance for program coordinators and evaluators include:

- What are the program's goals and objectives?
- What are the program's most important characteristics, i.e., materials, staffing, activities, administrative arrangements?
- How are the program activities supposed to lead to attainment of the objectives?
- Are the program's important characteristics being implemented?
- Are program components contributing to achievement of the objectives?
- Which activities or combination best accomplish each objective?
- What adjustments in the program might lead to better attainment of the objectives?

- What adjustments in program management and support are needed?
- Is the program or some aspects of it better suited to certain types of participants?
- What problems are there and how can they be solved?

Finally, a frame of reference is needed as a guide to assess and monitor the implementation of the program. The reference used in this project includes the learner, the teacher, the content of the program, and the context of the program.

Thus, the questions deducted from the proposal which will aid in the evaluation of the program follow.

QUESTIONS FROM FUNDED PROPOSAL

1. How recruit and enroll workers with inadequate basic skills?
2. How increase skills?
3. Are there changes in job advancement?
4. How document that there are 300 illiterate employees?
5. How will program graduates increase employees' awareness and recruit other participants?
6. What are components of Individual Development Plans?
7. What are results of TABE administration?
8. What are company incentives for participation?
9. How are job tasks and job-based literacy needs identified?
10. How will the program be delivered?
11. How will employees' understanding of computer instructions be measured?
12. How will literacy rates be established?
13. How has management promoted the program?
14. What is goal for graduation rate?
15. What are skills needed?
16. How will management identify potential participants?
17. How will learning styles be determined?
18. How will trainers be recruited from graduates?
19. Is coordinator supportive of participants?
20. Will a customized curriculum be established for each participant?
21. What computer software and hardware are available?
22. Who are participants?
23. How will barriers be removed for participation in the program?
24. Has management been briefed to build support for the program?
25. Have employees been briefed to build support?
26. How many employees have been enrolled in first six months?
27. How have administrators and participants been involved in curriculum development and evaluation of the program?
28. Have key job tasks been identified and described?
29. Is the training customized to include each participant's job tasks in training materials?
30. Has information been made available to workers?
31. Has a community conference been planned?
32. Are IDP's updated?
33. Has a tracking system been developed?
34. Is training available on a flexible schedule?
35. How did management spread word of program?
36. How is the basic skills program presented in the overall training program?
37. Are contacts with participants by coordinator documented?
38. Is a monitoring system in place to follow participants achievements?
39. Is there a project Milestone Chart?
40. Did the program impact company productivity?
41. Did the program impact employee decision making skills?
42. Is there increased interaction among all staff?
43. Are there changes in attitudes and beliefs?

APPENDIX B

Interviews with Project Director and Project Coordinator

A basic premise of this project was that a need existed for a program which would target workers with limited basic education skills. Given that programs originate from a needs assessment which documents a discrepancy between what the educational level of adult workers is and what the educational level could be, how was that gap, or need, established for the Weck Ed program?

In particular, the proposal had called for an educational response which targeted some three hundred workers to participate in the program. Because of the lag time between the submission of the proposal and the awarding of the grant, the company had experienced a twenty-five percent reduction in the workforce. That reduction included many of the estimated three hundred potential participants in the program. The basic educational level achieved by potential program enrollees was measured using a standardized test administered before the program began. Also, there was some carry-over from the pilot program implemented jointly with the participating community college in the present project. Scores on mathematics, reading levels, and GED level were thus available prior to onset of the present program.

Also, results from TABE (Test of Adult Basic Education) administrations were available for thirty-two individuals tested in 1991. Those results revealed that one-half of that test group scored below the sixth grade level, and five individuals were unable to read.

It is interesting to note that in the Southern Region of the United States approximately one-third (34 percent) of the population does not have a high school diploma. This rate is sufficiently different from the other regions with 20 percent of the populations in the Northeastern and Northcentral Regions being without diplomas and only 17 percent of the population in the Western Region without a high school diploma. In North Carolina, 1,416,966 persons do not have high school diplomas. Surprisingly, in 1993, only 1.2 percent of that number attempted to pass the GED requirements.

Thus, the policy of the company was that everyone needed to increase their basic skills. This position was one means of the company's effort not to label individuals as "basic education participants". Furthermore, literacy levels were to be established primarily through the use of job-related techniques which were in turn resultant from task analyses and needed job competencies.

A related issue was to determine how program participants would be identified by management without "labelling the participants". The proposed strategy was to ascertain through testing and examination of records those hourly wage workers who would qualify for inclusion.

A major affirmation of the company in securing the grant was that the management of the company would exert major effort to promate the program. The project director indicated that those major efforts would include notices on bulletin boards, company newsletters, meeting sessions in which

information about the program would be shared, and on-going meetings with management, project staff, and participants to discuss the project as it unfolds.

Also, the proposal affirmed that the project director and project coordinator would be supportive of all program participants. Thusfar, personal interviews and written feedback forms have confirmed that these two individuals have excelled in their approach and involvement in all aspects of the program.

One marker of a quality program is ownership developed through obtaining managerial support for the program. Plans to build support for the program at the management level included descriptive program bulletins and handouts, various visuals, and question-answer sessions during staff meetings.

Another major issue is how information is made available to all employees. Plans for publicizing the program included: "bug your supervisor, I want to participate", conversations of managers and supervisors with employees, company policy encouraging all individuals without a high school diploma to participate in adult basic education classes, and all employees were to be encouraged to participate in job-linked programs.

Thus, how did management spread word of the program? Major techniques were newsletters, notices on bulletin boards, logos on bulletin boards as conversation "ticklers" so that management would have an open door to talk about the program, and the personal contacts of the Project Director and the Project Coordinator who interviewed all the eligible persons.

A major concern of the management team was that individuals not be labelled in any negative fashion. The issue to be

addressed in the program then, is: how is a basic skills program to be presented in the overall training program of the company? The major focus is to weave basic skills training into ongoing job skills and competency training.

A strategic goal of this project is to promote the perspective that a better informed work force will have the ability to look beyond their immediate work environment so that they can see the "bigger picture" and at the same time improve the work processes in which they participate. A major goal is for every employee to be in a "learning mode".

The project jumpstarts with a beginning impetus. A number of the employees with limited basic skills have participated in a pilot project, and their experiences shared with other employees is a powerful recruiting mechanism. Individuals in that pilot project have received GED's and some have even enrolled in technical schools and community colleges. Finally, the motivation and determination of the Project Director and Project Coordinator are already key ingredients in the pursuit of excellence and success for program participants.

APPENDIX C

REVIEW OF WECK ED MID-PROJECT REPORT

At the mid-point of the project, the Weck Ed program is well into its implementation stage. Four contextual factors have impacted the program thusfar: (1) the company has been reorganized in that the ownership has changed; (2) there has been a reduction in force; (3) the project director was among thus who were released from the company; and (4) the community college has had to reduce its commitment and involvement in the program.

Another manager in the Human Resource section of the company has assumed responsibility for oversight of the program. A part-time instructor has been engaged to help in the instructional portion of the program.

The first phase of the Weck Ed program was to work with participants recruited from the Disposables Manufacturing group. The company initiated policy that promotions in this group may be a function of completion of a cross-training program in which group members would be expected to have knowledge of all jobs in the department and the ability to read and follow specifications for any given task.

Dr. Jennifer Coplin, using literacy task analysis, individual needs analysis, curriculum development, and instructional strategies to initiate the first phase of the program. Dr. Coplin evaluated the first phase of the program and found that management of the company and employee participants felt that the effort was most successful.

The Weck Ed program is a functional-contextual one in which skills needed to perform tasks on the job form the basis of the curriculum. Thus, the primary objectives of the program were to upgrade or update basic skills in accordance with changes in workplace requirements, technology, products, and processes; and to improve the competency of workers in speaking, listening, reasoning, and problem solving.

A needs assessment was conducted as the basis for the first phase of the program for the disposables participants. The assessment was based on personal interviews, task analyses, readability analyses, individual testing, and a literacy practices survey. Goals were then set for this phase of the project.

The first goal on enhancing basic skills used on the job was achieved by teaching specific job skills routinely required of the workers. The second goal of improving workers' flexibility to learn new skills was accomplished through an enjoyable learning environment and practice using job related materials. The final goal of encouraging teamwork was reached through small group activities.

The feedback about this phase was most positive with participants giving responses that averaged over 4 on a "5" point scale. Most positive responses included: learning from the class; helpful teacher; using what learned on the job; increasing desire to learn; and pay more attention to job tasks after taking the classes.

When asked "how could the class be improved", the

participants' major response was that they desired more time in class and longer time for this phase. "What did you enjoy most about the class?" Interestingly, participants reported that they enjoyed math, reading guages, learning to give and follow instructions, and the "written work".

The components of the class that the participants ranked the highest included: reading specifications; giving and receiving instructions; completing paperwork; reading guages; and math.

The second phase of the Weck Ed program was to implement the program in the "instruments" work cell. Again, the program was based on goals and strategies which grew out of a well-executed needs assessment. The major thrust of this phase was to involve the six members of the cell in some cross training and some problem solving through which each cell member develops responsibility for the entire manufacturing process rather than the past traditional approach. Thus, cell members were expected to divide the work, perform their own quality checks, and manage themselves insofar as possible.

A formal testing approach was not used, but rather the program coordinator gave individual feedback to each of the six participants. Overall, the cell members experienced the greatest success in reading and answering questions about charts and graphs, and identifying by name pictures of tools and machines to be used in their cell. They were less successful in matching terms and definitions, solving measurement problems, and reading blueprints.

A third phase of the Weck Ed program was to implement

the program among warehouse participants. Based on an employee education overview; interviews with management cell members, and supervisors; a literacy task analysis; a contextual pretest, and the TABE, the curriculum developed for this phase was a six and one-half hour series of classes. Major components of the curriculum include: communication skills, teamwork skills, understanding of the inventory control and accounting system, learning the Piling product identification system and the FIFO and Stock Locator system, and the lot numbering system and recall procedures.

Major outcomes thusfar include:

(1) Some participants in the first phase(disposables section) have been promoted.

(2) The participants enjoyed the process through helping to decide what to study, seeing direct application of what they learned, and feeling that they were successful.

(3) Awarding certificates by management rewarded publicly participants and promoted visibility of the program among the other employees.

(4) Naming the program, Weck Ed, enhanced reception of the program by employees rather than individuals perceiving a "literacy" program.

(5) The project coordinator, Jennifer Coplin, has implemented an "individully centered" approach which has led to success among participants and also greater visibility throughout the company.

(6) The Weck Ed program is well accepted as a meaningful effort to help the worker achieve success on the job rather than a "fad" which will quickly disappear.

APPENDIX D

PERSONAL INTERVIEWS AT THE MID-PROJECT POINT

Several objectives of the Weck Ed project prompted the outside evaluator to conduct semi-structured personal interviews with the project staff, company management, division supervisors, and program participants.

A major question proposed in the proposal was to identify whether the company's management was supportive of the project and how the information was routed to potential program participants. Thus, it was important to ascertain how the participants learned of the project and what were the stimuli that led to their participation.

A major formative evaluation issue was how did the participants rate their progression at the mid-point of the program. Did the participants feel that they had made gains? Did the participants perceive the support of management for their participation and was the cultural context of the company conducive to their participation?

Also, how effective was the primary project coordinator and "approachable" was she? Did the project coordinator convey an atmosphere of acceptance and the attitude of fostering and coaching success among the participants?

Since the company's ownership and management team was changed, did that change impact the program from the perspective of the participants?

Finally, did the participants perceive that their skills and competencies were altered so that improvements could be

transferred to the job? Could improvement in basic skills of adults impact their performance on the job? Would improvements in self image, self confidence, and interpersonal skills transfer to the job setting? Would gains in educational performance equal gains for the individual participant on the job?

INTERVIEWS WITH PROGRAM PARTICIPANTS, SUPERVISORS, AND MANAGERS

Interview 1

Respondent was a female working in the packaging section. She reported that she was going to school, i.e., to complete her high school requirements.

Her primary source of information at the management level was Karen Rice. When asked why she was in the program, she responded with enthusiasm, "to get my high school diploma".

What did she identify as the major benefit from the program thusfar? She indicated that she was learning much more about mathematics and that she wished that she had had the same motivation when she was younger.

Would the educational program help her on the job? The response was:"it could, but the major satisfaction will be that I have completed my high school requirements".

What were her perceptions of how other employees viewed her and the program? She felt that the overall feeling was one of encouragement. Why didn't other employees enroll in the program? She thought that their excuses were just that, excuses, and lack of time to be involved.

How did she perceive the management felt about the program? Her response was that she thought that they approved, that the program was okay.

Does the program have negative consequences for you as a participant? She could not think of any negative features, but reiterated that she enjoyed the program and she had already experienced personal and educational benefits.

On a scale of 1 to 10, with "10" representing that the program was great, she gave the program a score of "9".

Interview 2

Respondent was a male working in the instruments division. He was in a new work cell and working with the computer-assisted program to improve his educational level. He was most enthusiastic about being in the program, he really enjoyed computers.

He reported that he had learned about the program and participated because of the influence of Karen Rice. He also volunteered that Dennis Piper had been most supportive of his participation, and that Jennifer Coplin was "great".

Why was he in the program? He wanted "to learn as much as he could". He also recounted that he wished that the motivation had been there earlier in his life.

He felt that the attitudes of co-workers in his unit were most positive. He indicated that he had another co-worker in his group in the program. He reported that all of his supervisors were supportive of the program.

He perceived that participation in the program was "some hassle" and some negativism existed among employees about the program. He did not perceive a shift in attitude about education had occurred among the management team.

He recalled that he had seen a poster describing the program, but the major impetus about the program had come from Karen Rice. He volunteered that he was "telling other workers to get involved in the program".

Was his participation in the program helping him on the job? His answer was a positive yes for he thought that he was able to use his educational gains on the job and he felt better about himself.

On the 10 point scale, he gave the program a rating of "8".

Interview 3

Respondent was a female working in the disposables unit. She was recruited by Karen Rice, but she also had seen some memos and heard of the program and volunteered to be a participant.

Have you noticed any benefits from your participation in the program? Yes, she indicated that she was much more interested in education and life in general. She felt that she was more confident of herself and better able to contribute to her team and to the organization.

Had this respondent applied what she was learning from the program to the job? She felt that the program had major benefits for her in the areas of mathematics, reading instruments, and reading general books. She felt that she was using her newly gained knowledge daily on the job. She also reported that the definitions of words that she had learned was a major assest for her on the job.

What did she perceive to be the major benefits of the program? Without hesitation, she indicated that there would be less "down time", increased profits, and better working relationships among employees.

She reported some "teasing" about her participation in the program, but she was working on an important goal for herself. Also, she was now in a better position to teach others.

What was management's position about the program? This respondent felt some pressure to improve her educational skills.

What were the benefits of participation in the program? She felt that she could obtain a promotion in her work. She identified personal goals of being a positive role model for her child, make her father proud of her, and it would benefit her.

She was proud of her accomplishments thusfar, for she had a positive increase in her standardized test scores. Her group manager was perceived to be supporting her in a positive manner. Only a few of colleagues were expressing negative doubts about the program.

Jennifer Coplin was identified as an excellent teacher, and this respondent felt that everybody in the class was learning. This interviewee was most proud of her new understanding of reading and mathematics.

On the ten point scale, she gave the program a score of "9".

Interview 4

This interviewee was a worker in the disposables section. The offer to obtain a high school diploma was the motivation for this woman to enroll in the program. She had originally signed up in the pilot program to pursue her high school

diploma through the community college which was cooperating with this company in the work place literacy program. And, she was proud that she had quickly advanced to the GED program in one year.

She was quite "proud" of her company for their offering of this opportunity to employees. She reported that she did not know of another company that had supported such a program for employees.

What were the benefits of the program? She felt that a promotion would be a job benefit and she would personally benefit because she would know more, know many more "words", be more confident, and be more comfortable in carrying out her responsibilities.

What were the reactions of her colleagues? She had heard no negative comments. She thought that her supervisors were glad for her. She only wished that the program had been there so that she could have started earlier.

She knew she would tell others about the benefits of the program since she would have her diploma to demonstrate what could happen to participants. She thought that her thinking abilities had greatly increased.

Jennifer Coplin had done a good job as the instructor. The program had helped this respondent in terms of how to better do her job. Participation in the program had taught her how to cope with people and had increased her interpersonal skills.

She gave the program an "8" on the ten point scale.

This gentleman was a program participant from the instruments division. He too was a participant that was continuing from the pilot program with the company and the community college.

He reported significant improvements as results of his participation in the program. He had increased from a second grade level to the eighth grade level through his involvement in the program.

The program had been most beneficial for him in that his reading skills had increased dramatically and his new math skills were most helpful on the job. He indicated that he was thankful for the company supporting this program, for he wished that he could have started "sooner" to improve himself.

The company had been most supportive of employees being in the program. He was grateful for the company's hourly support of him in the program as the company paid him on a sharing basis for his volunteering to give time on his own to be in the program.

Yes, some people teased him about being in the program, but they didn't share his aspiration to go to college. This aspiration is quite significant since this respondent was starting with a second grade achievement level.

He would share information about the program with everybody, for the program would benefit everybody.

His score on the ten point scale was an "8".

Interview 6

This woman was a group leader in the disposable section, and she participated in the leadership portion of the program and also supervised employees in the first module of the program.

How did she learn of the program? She had heard of the program from colleagues and participants from the first group in the program, and her supervisor had supported her in becoming involved in the program.

She had not perceived a great deal of support from management and she had not observed many promotions in her division of the company. The big initiator for her involvement was her drive to advance in the company. She had higher goals to move further in the company and wanted to respond to greater functions of group leaders. She reported: "I really wanted to have a position in the office but they said that I needed experience". So, I became involved to improve my skills and increase my experiences.

Thusfar, the program has given me a better feel for the company and its goals. And I feel better as an individual.

I learned of the program from memoranda circulated by my supervisors.

She reported that she had observed a positive change of attitudes among her colleagues who had completed the first phase of the program. She, herself, was the second individual to get a better job because of the program, and had greater self-satisfaction because of the program.

She perceived that the management was supportive of the program, and that her supervisor thought that "the program was wonderful".

How had other employees interacted with her about her participation in the program? She thought that the only negative feature was the line that "I wouldn't have started the program at that age".

What were the main benefits of the program for her? She felt that she and the other program participants were better able to read and use figures and labels, do computations, and read.

The program had enabled her to work better with the staff. She would spread word of the program to other employees and she would express her positive attitudes about and her appreciation of the program to others.

She gave a rating of "9" on the ten point scale to the program.

Interview 7

This respondent was a supervisor in the instruments section when the Weck Ed program was underway. He saw himself as a "coach" for the employees under his supervision.

He found that employees that had completed the program were better communicators. He also thought that their skills had increased that when confronted with a quality program, the participants were more competent and more motivated not only to seek solutions but also were more willing to be verbally involved in solving the problem.

He felt that individuals under his supervision were empowered through the use of Total Quality Management techniques of brainstorming and affinity diagrams. An important feature of these tools is the equality of ideas and participation of individuals.

Given as assignment of reducing scrap, a TQM team, "ready and willing", studied the situation and proposed recommendations which led to the reduction of scrap by seventy percent.

This supervisor felt that the management of the company had total support for the program. He also felt that the environment for participation in the program by employees was positive with no negative peer pressure.

Benefits of the program for the company were savings of materials, reduction of scrap, and improvement of crucial processes in plant operations.

He also felt that if workplace literacy programs are to be successful, management support was needed throughout the program period and company support was necessary beyond the project period if literacy advances were to continue and to be sustained.

Interview 8

This respondent was a supervisor in the disposables section. He felt that there was total management support for the Weck Ed program. He saw the project as a means for the company to link improvement in individuals to the company's strategic

plan. He thought that this company's support of the project was unique in that other companies would not see education of employees as a vital process and other companies were more apt to raise standards as a goal rather than improving employee skills and competencies as a goal.

He perceived that management valued training, and perhaps more emphasis could be placed on the alignment of training and education. He envisioned a reciprocal relationship between training and education in that helping employees through training them to carry out job responsibilities helped them with literacy competencies and vice versa.

Major benefits of the program that he had observed thusfar were increases in reading skills (moving from sixth to tenth grade levels) and changes in reading and math skills (measured with pre and post tests) were statistically significant.

He took more time with employees that he supervises and shares with them which are positive motivators for the employees. Testing of the employees gave the company good data on where employees are in terms of grade level.

A positive feature of the program is that recognition is given to employees for educational improvement. Employees completing the program have improved job performance, and they feel better about their performance and their understanding of company goals. He felt that is assignment of responsibility to individuals empowered employees and improved morale as employees told him that assignment of responsibility to individuals was a "great decision".

Interview 9

This respondent was on the managerial level in the office. She thought that the program originator, Karen Rice, had recognized the need for the company's involvement in helping employees improve competencies as the company became more technologically advanced. She thought that the need was for a program for employees which would be implemented in a non-threatening environment. She perceived total management support for the Weck Ed project from the start.

How had management communicated about the program? Major techniques were employee group meetings and managers (supervisors) meetings. Newsletters were also important means of communicating information and management support of the program.

This respondent felt that the top management had supported and very positive attitudes about the program. Thusfar, benefits to individuals were increased skills in communication and ability to complete various written forms. Benefits for the company included increased ability to read product specifications and complete required reports.

She felt that participants in the program had improved their skills in diagnosing problems and suggesting solutions. The managerial environmental for the most part had been positive, but she had detected some negativism at the start of the project, but that negativism had been replaced with positive attitudes and increased enthusiasm and motivation.

She felt that there was need for continued company involvement through various continuing education opportunities.

Interview 10

This respondent was a manager of a department for the total company. He indicated that Karen Rice had been the primary driver for the project, and his role had primarily been one of review of progress and achievements.

He expressed great appreciation for the Weck Ed program and felt that Jennifer Coplin had done an excellent job and had brought essential skills and experiences from previous work with workplace literacy programs.

The project was perceived as one that was setting a new course for the company with respect to the empowerment of employees and the development of leadership skills among employees.

He indicated that he had only received positive feedback and positive attitudes expressed about the program from both employees and supervisors. He indicated that the attitudes of top management were positive.

A major benefit of the program was one of improved communication throughout the organization. He felt that almost everyone knew about the program and that knowledge would lead to greater participation and endorsement of the program among the employees.

CONCLUSIONS

Based on the preceding semi-structured personal interviews, the following conclusions are offered:

1. Company support of the Weck Ed project is positive and evident throughout the company.

2. Primary management initiation of the project was through Karen Rice, Project Liaison.

3. Jennifer Coplin, Project Coordinator, was well-received by project participants, was rated an effective and empathetic teacher, and brought valuable skills, insight, and experiences from previous workplace literacy projects.

4. Primary benefits to the company were: increased skills of participants with respect to reading skills, reading guages, interpreting charts, and performing mathematical operations.

5. Primary benefits to the individual were: increased self-confidence, increased motivation, increased interpersonal skills, and increased leadership skills.

6. Primary skills of participants which could be transferred to the job were: reading guages and specifications, job coping skills, and better understanding of how to work with colleagues.

7. Participants are appreciative of company's support of their involvement through cost sharing of training (hours contributed by company).

8. Participants feel empowered by company to be actively engaged in decision-making and diagnosing and solving problems.

9. Participants report competency gains in reading, comprehension, and mathematical skills.

10. The Weck Ed project has fostered increased organizational support and loyalty among participants.

APPENDIX E

TENTATIVE EVALUATION PLAN

December, 1993

TENTATIVE PLAN FOR THE EVALUATION OF THE WECK EDUCATIONAL DEVELOPMENT PROJECT

Prepared by:

R. David Mustian, Ph.D.
December, 1993

I. Project Implementation

Evaluation Objectives:

Evaluator will provide input and feedback on:

a. proposal components; identification of overt and implied tasks in proposal; review with industry and project director and coordinator.

b. proposed program implementation and identified match of program objectives with program goals.

c. proposed program activities.

d. proposed measures to document on-going program successes.

e. proposed measures to document outcomes related to program interventions.

f. proposed measures to assess the overall impact of the project and the latent consequences of the project such as worker attitudes toward work and attitudes toward self.

Evaluation Tasks:

Review and critique program design and implementation with respect to evaluation strategies and tools.

Project Coordinator: Send curriculum plans and progress reports.

Evaluator: Provide feedback and input (3.0 days).

II. Formative Evaluation of Project

Evaluation Objectives:

Describe the implemented program and make recommendations.

The descriptions will include:

a. program context

b. roles of stakeholders

c. critique of proposal

d. implementation plan and subsequent changes

e. background of needs identification

f. curriculum development

g. project initiation

h. instructional strategies

i. tentative findings

j. adjustments to program

Evaluation Tasks: Review all project reports and interview program participants and stakeholders.

Project Coordinator: Provide reports; set up stakeholder and participant interviews.

Evaluator: a. Develop tentative evaluation plan (1.0 day).

b. Visit project and interview decision makers, project leaders, and participants (2.0 days).

c. Review reports; write formative evaluation (2.0 days).

III. Summative Evaluation

Evaluation Objectives:

Evaluator will:

a. Provide input and feedback for measures of success for program outcomes and organizational impacts.

b. Describe program implementation as it unfolds.

c. Analyze outcomes to determine:

-- increase in job skills

-- changes in job advancement

-- number of individual development plans

-- changes in workers' accomplishments

-- improved plant productivity

-- changes in employee interactions

-- changes in employees' attitudes

-- number of employees cross-trained

Evaluation Tasks: Descriptions are to be based on implementation reports provided by project; summarized measured results; and results of site interviews and visits.

Project Coordinator: Provide all reports and information in writing.

Evaluator: a. Process all background information (1.0 day).

b. Discuss and describe adjustments to program implementation (1.0 day).

c. Critique and describe measures of success (0.5 day).

d. Develop evaluation tools (1.0 day).

e. Interview project personnel, key decision makers, and other stakeholders including program participants (1.0 day).

f. Share findings with project personnel (0.5 day).

g. Develop summative report (2.0 days).

Total Days: 15

APPENDIX F

OUTLINE OF ORAL REPORT TO PROJECT DIRECTORS

WECK EDUCATIONAL PROGRAM

I. Evaluation Model
   A. Where is the program going?
   B. How does it intend to get there?
   C. How will I know if it is successful?
   D. Are there alternatives to this program?
   E. What are long term implications of this program?

II. Frame of Reference
   A. The learner
   B. The teacher
   C. The context--physical, social, psychological
   D. The content--the program

III. Needs Assessment
   A. What was
   B. What could be
   C. The Wake-Orange-Durham environment

IV. The Proposed Program
   A. See Schedule A

V. Project Director and Project Coordinator Interviews
   A. Questions from Schedule A asked: 4, 7, 12, 13, 15, 16, 19, 24, 29, 34, 35, and 41

VI. Interviews with Participants and Supervisors
   A. Questions:
      1. What is your primary job responsibility?
      2. What part of the program are you participating in?
      3. How did you learn of the program?
      4. What are your personal goals for the program?
      5. How do you think your co-workers feel about the program?
      6. Are your supervisors supportive of your participation?
      7. Is management supportive of the program?
      8. How do you perceive the performance of the program coordinator?
      9. Are there individual costs for participating in the program?
      10. How did you actually learn about the program?
      11. Are you sharing with co-workers?
      12. Is your participation helping on the job?
      13. How would you rate the program on a 10 point scale?
      14. How have you benefited from your participation?

VII. Comments on the Mid-Project Report
   A. Excellent progress has been made
   B. Participation greater than anticipated
   C. Task analysis, individual needs analysis, curriculum development successful

D. Cross training design effective
E. Teaching plan well developed
F. Company support known and appreciated
G. Needs assessment completed
H. Participants' evaluation of program excellent
I. Formative indicators reflect acceptable progress toward goals
J. Training was tied to job skills
K. Promotion of program great
L. Next steps developed

Schedule A

QUESTIONS FROM FUNDED PROPOSAL

1. How recruit and enroll workers with inadequate basic skills?
2. How increase skills?
3. Are there changes in job advancement?
4. How document that there are 300 illiterate employees?
5. How will program graduates increase employees' awareness and recruit other participants?
6. What are components of Individual Development Plans?
7. What are results of TABE administration?
8. What are company incentives for participation?
9. How are job tasks and job-based literacy needs identified?
10. How will the program be delivered?
11. How will employees' understanding of computer instructions be measured?
12. How will literacy rates be established?
13. How has management promoted the program?
14. What is goal for graduation rate?
15. What are skills needed?
16. How will management identify potential participants?
17. How will learning styles be determined?
18. How will trainers be recruited from graduates?
19. Is coordinator supportive of participants?
20. Will a customized curriculum be established for each participant?
21. What computer software and hardware are available?
22. Who are participants?
23. How will barriers be removed for participation in the program?
24. Has management been briefed to build support for the program?
25. Have employees been briefed to build support?
26. How many employees have been enrolled in first six months?
27. How have administrators and participants been involved in curriculum development and evaluation of the program?
28. Have key job tasks been identified and described?
29. Is the training customized to include each participant's job tasks in training materials?
30. Has information been made available to workers?
31. Has a community conference been planned?
32. Are IDP's updated?
33. Has a tracking system been developed?
34. Is training available on a flexible schedule?
35. How did management spread word of program?
36. How is the basic skills program presented in the overall training program?
37. Are contacts with participants by coordinator documented?
38. Is a monitoring system in place to follow participants achievements?
39. Is there a project Milestone Chart?
40. Did the program impact company productivity?
41. Did the program impact employee decision making skills?
42. Is there increased interaction among all staff?
43. Are there changes in attitudes and beliefs?